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THE AMERICAN
JOURNAL OF PHARMACY

MAY, 1918

EDITORIAL.

A JOURNAL THAT IS READ.

Quite naturally an editor endeavors to gauge the effect of his work, to determine whether the selection of matter published, the literary menu that he serves, is acceptable and inviting to his readers. He realizes fully that the extent to which the publication, whose course for the time being he is shaping, is read determines not only whether he has the right viewpoint and ability but, likewise, whether the publication is fulfilling its proper sphere of usefulness as an educational medium, stimulating progress and recording the advancements in the interests which it serves and is a measure, also, of the service which it renders to its advertising clientele. Consequently, an editor, who conscientiously is concerned, is on the alert for evidences as to extent to which the subscribers are reading the journal and each wind-blown straw is indicative to him and becomes a foot rule of the success of his efforts.

An editor mentally debates if an original contribution is on a subject that will prove of interest to his readers. Somewhat uncertain of his decision to accept and publish, he awaits results. When he later finds that the paper has excited comment or republication in other journals, his debated query is answered. Again, an article in another journal impresses him as worthy of reprinting, but he is confronted by the thought that it is too technical to interest very many readers. However, he decides to reprint it and shortly his heart is gladdened by a letter from an esteemed educator commenting upon the pleasure he had experienced in reading this same article and, above all, a new subscription is directly traced thereto. Such examples are satisfactory affirmations of the correctness of his judgment.

The editorials, that gave publicity to his personal ideas upon current events, are possibly the most frequent subjects for his mental debates. To get the right "punch" in these to make them effective yet not repellant is at times difficult, especially if he is working under a high tenson and there is cause for vigorous expression.

Consequently, the editor welcomes not only timely contributions, but, likewise, suggestions and comments, even adverse criticisms of the articles he publishes as evidences of the value of his publication. Even though such comments refer only to errors of writers or of the compositor, they have a dual significance to him; first, because they give an opportunity for correction of the error and secondly because they show that the journal is read.

Coming down to the first person singular, the present editor of the AMERICAN JOURNAL OF PHARMACY has had some personal experiences that well illustrate the foregoing general remarks. The librarian of one of the departments of the government was one of a number of readers who called my attention to an error on the cover page of the February and March numbers of the JOURNAL, where the current volume was printed as "Vol. 91" instead of Vol. 90.

The communication of Dr. V. K. Chestnut published in the "Correspondence" in this number of the JOURNAL gives us an opportunity to correct an oversight, an inadvertent lapse of memory for the time being of a valued contributor. In commenting upon the award of the Hanbury medal to Prof. Greenish, the contributor referred to the late Prof. John M. Maisch as the only American who had been so honored, thus overlooking the fact, to which Dr. Chestnut directs attention, namely, that Dr. F. B. Power, a graduate of the Philadelphia College of Pharmacy, whose achievements in pharmaceutical and chemical research we have greatly admired, was among the few who had been so signally honored and that Dr. Power was an American of whom we are justly proud.

The fact that Dr. Fred. B. Power was for so many years a resident of England and that while residing there he engaged in some of his most noted investigations and that these were generally published as contributions from the Research Laboratories of Burroughs Wellcome & Co. has possibly led many who were not acquainted with his history to imagine that he was of English birth. Our contributor doubtless had so firmly impressed in his mind the association of Dr. Power with the literature of pharmacy and chemistry emanating from Great Britain that temporarily he was forgetful of the

fact that our eminent alumnus was at all times a citizen of the United States, loyally adhering to American principles and traditions.

CAN PRICE-CUTTING BE CONTROLLED BY THE PRESENT LAWS?

The advocates of price maintenance are taking to themselves great encouragement and consider that their cause has been greatly advanced by the recent action of the Federal Trade Commission in filing complaint against Sears, Roebuck & Company, the Chicago mail-order house. They have gone so far as to claim that this complaint "is in complete harmony with the principle and purpose of the Stephens' Bill," the passage of which by Congress they are advocating, and to state "that the object of the latter bill is to protect the public against dishonest advertising and false pretenses in merchandising." Radical claims of this character may do their cause far more harm than good. The passage of the Stephens' Bill in its original wording will yield far less protection against dishonest advertising and false pretenses in merchandising than can be obtained by existing laws.

The truth is that the Stephens' Bill aims to extend *price monopoly* to articles already enjoying *monopoly of production* by virtue of being protected by patent or trade-mark and does not extend the principle of *real price maintenance* to all merchandising. Our patent laws aim to stimulate and encourage invention by granting for a period of years a *monopoly of manufacture,* but it never was the intent that our patent laws or trade-mark enactments should likewise establish the principle of price monopoly for products so protected. It should be so well known to the drug trade that comment should be unnecessary, that certain foreign holders of United States patents on medicinal chemicals, by unauthorized methods, stretched the patent protection to cover the right to forbid resale of their products which they had marketed in other countries into the United States, for the purpose of compelling the American consumer to pay prices many times in advance of what they supplied their products in other countries. It is somewhat peculiar that some of those who years ago so strenuously objected to the surreptitious methods of these German manufacturers, should not realize the danger of engrafting such a fallacy onto our patent law. The very fact that it is now aimed to create for patented articles *price monopoly* proves that such

has not been a privilege heretofore enjoyed by patentees and that the foreign manufacturers should never have been permitted to thus mulct the American public.

A study of the language of the complaint filed by the Federal Trade Commission in the case cited, shows that the action has been taken under the Congressional enactments of September 26, 1914, and October 15, 1914, and that the complaint is *based upon the methods adopted* by the respondents in advertising, not a patent or trade-marked commodity, but an article of general distribution, a prime necessity—sugar. We do not understand that the use of sugar as a "leader" even was objected to but the advertisements of the sugar were such as to be considered by the Commission as *false and misleading* and that the purpose and intent and effect of the respondent company was to harrass and embarrass competitors and to suppress and stifle competition. Further, that in certain advertisements it had been represented that the quality of similar wares sold by competitors was inferior and that the competitors did not deal justly with their customers and that the respondent buys its goods in markets not accessible to its competitors and it complained "that such advertisements and statements are false and misleading and calculated and designed to deceive the trade and general public." It is further alleged that their method of offering sugar was discriminating in price between different purchasers of sugar, and that the effect of discrimination was to lessen competition and tended to create a monopoly.

It will be thus seen that the action is *against unfair and misleading statements and because these tended to create a price monopoly* and that in this respect the present laws have the very opposite purpose to the aims of the Stephens' Bill. It is our opinion that the present laws against improper advertising and false or misleading statements contained in such with the intent of deceiving, can effectively control such unfair trade methods and that by their enforcement these evils of commerce can be eliminated.

It must not be understood that we are at all adverse to price maintenance, but we submit that this should be accomplished by laws, if such are necessary, that will cover all forms of merchandise and not by special legislation to give price monopolies to products already guaranteed the monopoly of manufacture by patent right or trade-mark. If the advocates of fair trade by price maintenance will appreciate the necessity for a bill that carries the *real principle* to all

lines of merchandising they will greatly enhance the prospect for early and favorable congressional action.

G. M. B.

A BRIEF SUBMITTED IN FAVOR OF ESTABLISHING A PHARMACEUTICAL CORPS IN THE UNITED STATES ARMY AS PROPOSED BY THE EDMONDS' BILL, H. R. 5531.[1]

HON. S. HUBERT DENT, JR., CHAIRMAN AND MEMBERS OF THE COMMITTEE ON MILITARY AFFAIRS, HOUSE OF REPRESENTATIVES OF THE UNITED STATES:

Gentlemen: On behalf of the various national, state and local pharmaceutical organizations represented here as the proponents of the measure under consideration and, likewise, in the interest of the many thousands of men in the army of our country who are now experiencing the trials and dangers of soldiering, this formal argument is presented.

The earnest consideration of Congress is requested to the wholly inadequate and dangerous methods of dispensing medicines practiced in our national military service. In contrast with the highly organized and efficient pharmaceutical service assured alike to his French compatriot and to his German enemy is that stintingly granted to the American soldier. This is humiliating to the pharmacists of this country and is not at all creditable to the Medical Department of the Army and is incompatible with the standing of the United States among the nations.

SHORTCOMINGS OF THE ARMY HOSPITAL SERVICE.

The shortcomings of the hospital service of the army has been the subject of repeated reports and in the past there have been before Congress several measures whose purpose was to bring the personnel of the Hospital Corps to a grade of efficiency commensurate with the grade of service which its members are expected to perform.

In the last annual report of the predecessor to Surgeon-General Gorgas, he referred to "the injustice which was done to the Hospital

[1] Filed with the Committee on Military Affairs, at the hearing held Tuesday, March 19, 1918.

Corps which has made it difficult to obtain a good class of men and retain the services of non-commissioned officers. When the Hospital Corps was organized in 1887, it was recognized that its members would be required to do work that was not attractive to enlisted men and which would require special qualifications. . . . Opportunities for extra duty pay are provided in other branches of the service, but are denied to Hospital Corps soldier." To this he might have added that in the other lines of service, the intelligent, capable man can be promoted and attain commissioned rank and keep in the line of advancement, but in the hospital Corps he can never become more than a sergeant and after years of faithful service and reënlistments he may be credited finally with the non-commissioned grade of master hospital sergeant.

At that time, Brigadier-General Tasker H. Bliss, commanding the Southern Department, in his annual report said: "The condition of the Hospital Corps at the present time is a matter of very serious concern. The number of men present for duty is altogether too small to permit the efficient performance of the work that regulations, orders and customs of the service seem to require to be done. The service is so arduous for the really good men, and so unattractive, and the pay is so small that the application for transfer to the Corps of a superior man is now an extremely rare occurrence. There are very few applications for authority to reënlist, while there is a constant depletion due to desertions and discharges."

A writer, editorially commenting upon these Departmental reports, wrote: "Owing to these and other inequalities of pay and opportunity, the Hospital Corps is now recruited mainly from men who realize their inability to make good in other branches of the service where the pay and opportunities for advancement are so much better. It is a matter of official record that the morale and quality of the Hospital Corps are progressively declining quantities."

In the report of the then Surgeon-General, he urged that "the Secretary of War recommend to Congress the reorganization of the Hospital Corps" and openly stated that this "was one particular in which the Medical Department is unprepared to fulfill its responsibility to the Army and the nation." The reorganization then recommended by keen and competent military authorities has not yet been accomplished, despite the present war necessity for more efficient service. The *Journal* of the American Medical Association,

at the time and since, has advocated reorganization and efficient assistance to the physicians and editorially stated "there should be no opposition from any quarter to legislation that would remedy an obviously dangerous condition."

The Surgeon-General is held responsible for the health of the Army and the efficiency of its medical service In the recent hearing before the Senate Committee on Military Affairs, "Surgeon-General Gorgas described the difficulty of caring for the men in the camps with the untrained orderlies who are generally charged with looking out for the less serious cases of illness." In this statement he admits the inefficiency of the hospital service for which the responsibility is upon his Department and which the enactment of the bill now under consideration would in a large measure correct by providing an organized pharmaceutical corps which would give to the physicians the needed intelligent assistance and provide the grade of service in this Department which the soldiers are entitled to receive.

The Soldier is the Ultimate Concern of the Medical Department.

Those in the military service of the nation are entitled to the very best medical attention that the government can procure. A nation that is proclaimed as the wealthiest and as the most progressive of all nations must not assume any second place in providing the means for the preservation of the health and lives of those serving in its army. The people of the United States will expect the Medical Department to adopt the most efficient methods for the conservation of the health and lives of our soldiers and for the recuperation of the unfortunate wounded. In this war, as never before, must human lives be salvaged and national resources conserved and our national assets, of education as well as of materials, be utilized to the best advantage if victory is to be ours. The nation will not be contented to accept such platitudes as "the needs of the soldiers can be provided for satisfactorily under the present organization." Especially not when the inefficiency of the service has been pointed out in reports emanating from the same Department.

Surgeon-General George J. H. Evatt of the British Army very aptly stated "that the Medical Department existed for the indi-

vidual benefit of the soldier and if they failed in their duty to him they were not faithfully discharging their obligation. The ultimate soldier was the person whom they all served."

How Drugs Are Dispensed in the United States Army.

The dispensing of potent remedial agents, whether in civil practice or in the military service, should be restricted to those who have been especially educated and trained as compounders and dispensers of medicines. This principle is so thoroughly established that the states, and, likewise, the District of Columbia and our insular possessions, in the exercise of their police power, have by legal enactment provided for boards of pharmacy to examine and license those to whom authority only is given to compound and dispense medicines. Nevertheless, in the Medical Department of the Army, this principle, firmly established in the laws for the protection of the lives of the people, is ignored and the dispensing of medicines to our soldiers is permitted to be done frequently by the unqualified private who has had no pharmaceutical training. From one camp comes the information: "A motorman, a butterman and an apprentice machinist are over me (a graduate of a school of pharmacy) and according to army regulations are dispensing and compounding medicines to men in the army."

The Army medical supplies necessarily include such poisonous drugs or their preparations as aconite, atropine, belladonna, cocaine, colchicum, hyoscyamus, morphine, nux vomica, opium and strophanthus. "The dispensing of drugs or compounding of prescriptions is done by the non-commissioned officers of the Medical Department," we are officially informed and the information is at hand that in many cases these sergeants are without any special education or training and would not be admitted to the examinations of any board of pharmacy. Surely the soldier is entitled to pharmaceutical service and protection equal at least to that which his state provides for him in civil life.

Under such conditions, we are compelled to accept as facts such reported errors as "the dispensing of antiseptic tablets of bichloride of mercury instead of phenacetin and normal salt solution tablets," "morphine tablets for calomel," "digitalis tablets for Brown mixture tablets" and "liniment tablets given internally."

The statement has been officially made that "the pharmaceutical

preparations of the Army, especially in time of war, are for the most part in tabloid form; the pharmacy is therefore a matter of dispensing rather than of compounding of preparations." This indicates that pharmacy as practiced in the U. S. Army is very elemental indeed and that even the very basic ideas of professional pharmacy are ignored. Such service must necessarily be far from satisfactory or efficient as protecting the interests it is supposed to serve.

On the battle line and in advanced positions, drug dispensing is necessarily limited and confined mainly to first aid. However, in the hospitals and in the convalescent homes and infirmaries, treatment is given to many sufferers from disease as well as the wounded and here will be found many cases requiring continuous and extended treatment and such cases will rapidly multiply as the war is prolonged. To seriously propose that such shall be treated with "canned medicine" in "tablet form" and denied the services of competent compounders of appropriate remedies is certainly not in accordance with our present knowledge of what is essential to conserve life whether in time of peace or "in time of war."

For some purposes, tablets are a convenient and useful dosage form, but for many purposes and for many medicines they are absolutely unfitted. Not infrequently, where prompt and reliable action is desired, the conscientious physician is compelled to select some other form of medication. The most serious evil resulting from this "ready made medicine" and tablet dosage is that too often the patient is made to fit the medicine on hand instead of a remedy being prescribed to fit the needs of the patient. There can be no question as to the superiority of the individual treatment over this method of "treatment *enbloc.*" The proper method and the ideal professional method would be for the physician or surgeon to diagnose each case, prescribe what that patient needs at the time and to have the medicines compounded freshly and dispensed by a competent pharmacist. To do otherwise is dangerous to the life of the patient and detrimenal to the medical service.

Pharmacy an Important and Scientifically Developed Branch of Medicine.

The progress of the sciences has necessitated differentiation and specialization and this has separated modern medical practice into

various branches, such as medicine, surgery, dentistry, veterinary medicine and pharmacy, and upon each branch devolves important duties for society. These are distinct yet equally important and interdependent upon each other. The medical practitioner and the surgeon are not trained to prepare medicines and as a rule are but very indifferently acquainted with drugs or their composition and the methods of preparation and the compounding of medicines. These are the special province of the pharmacist and upon the proper performance of his duties, the practitioners of the other branches of medicine are compelled to rely. Unless the drugs are properly selected and the medicines skilfully prepared and dispensed their skill and knowledge goes for nought. Upon the faithful and capable performance of the work of the pharmacist depends the success of the medical profession and, likewise, the lives of the patients.

The pharmacist of to-day is a professionally educated gentleman and his qualification to practice his profession is passed upon with as much care as is done in any of the other professions. The minimum preliminary education is fixed by many state statutes and his professional education is established by a National Syllabus of studies. In addition many are taking special postgraduate work in the higher scientific studies such as bacteriology and clinical chemistry. The established regular pharmacy course includes anatomy, physiology, materia medica, botany, pharmacognosy, chemistry, practical compounding, posology, toxicology as well as commercial training and to make sure that he has the experience, most of our states require four years practical pharmacy experience before licensure. It will be thus seen that the pharmacist is well equipped to perform his special functions in the interest of society. Moreover, a professional pharmacist is necessarily a continuous student as with each advance either in pharmacy, medicine or allied science he is compelled to further study.

American pharmacists hold a prominent position in the world development of their profession, and their standing is repeatedly recognized by foreign authorities and their investigations and research work have been very generally accepted as conclusive. The United States Pharmacopœia ranks as the peer of any national pharmacopœia. In the more recent revisions of this authority, the pharmacists have contributed very largely the chemistry, botany

and pharmacognosy of the standards as well as most of the formulas contained therein. The other legal authority for medicines, the National Formulary, has been prepared entirely by a committee of the American Pharmaceutical Association. It is inconceivable that the War Department should ignore this important branch of the medical profession and to-day has not commissioned in its service a single eminent pharmacist. Pharmacists are not unpatriotic and are not unwilling to serve their country but they resent being advised that there are but "two avenues open for pharmacists in general at the present time: (1) To enter the Hospital Corps as a private. (2) As a non-commissioned officer in the Medical Enlisted Reserve Corps." The acceptance of such advice they realize means destruction of their professional and business success for a service in which after possibly years of duty and even with reënlistment they might attain the rank of master hospital sergeant and without future prospect either in civil or military life.

Equally are they ready to resent the imputation that this bill "is designed for the benefit of the persons desiring to enter service—through increased rank and pay." Pharmacists are fully justified in insisting that there shall be organized pharmaceutical corps in the government service, through which the members of this branch of the medical profession can render their most efficient service to the nation. In civil life both the practitioners of medicine and of pharmacy are essential for the conservation of life and health. Will not the conservation of the lives and health of our soldiers also require the exercise of both of these professions? Physicians are not called upon to enlist as privates and to work up from such to the higher position in the medical corps. Then why must pharmacists be so unjustly treated?

Pharmaceutical Service a National Asset.

Pharmacy is recognized in civil life as the right arm of medicine and there is no reason why this position is lost in military duty. It is a waste of the nation's resources to utilize medical men to perform duties for which pharmacists are especially trained and for which the medical man has no liking. Especially so, when there is urgent need for the skill of the medical man along the very lines of his special education.

It is gratifying to note that the leaders in the medical profession

are outspoken in their support of pharmacy as a necessary branch of the military medical service and in favor of its proper recognition with commissioned rank.

The *Journal* of the American Medical Association, on June 16, 1917, editorially commented:

> So far as official recognition of it is concerned, the science and art of pharmacy might not exist for the Army. To-day, as never before, victory in war goes to the nation that most effectively preserves the health of its fighting men. The physician is now of such military importance that the medical profession will be called on to make no inconsiderable sacrifices. It will materially lighten the arduous duties and responsibilities of the physician to have in the Army trained pharmacists who will be able to give intelligent coöperation. But it is imposing too greatly on the patriotism of those whose special knowledge is obviously a large asset to the Army, to expect them to enlist as privates without any recognition of their national worth. Pharmacists should be given a rank commensurate with their importance, first because it is but a simple justice to the pharmacists themselves, secondly, because the usefulness of the medical corps will be greatly augmented and, lastly, and most important, because the efficiency of our Army demands it.

War is the supreme test of a nation's efficiency and in time of war it is of paramount importance that each man be put to the work in which he can render the most useful service to the nation. The magnitude of modern warfare demands the most perfect organization and the most effective service and nowhere is this of more importance than in the medical service of the Army and Navy.

Each line of activity requires specialized education and training, and to permit one branch of activity to encroach upon the special field or duty of another means national inefficiency, if not actually national suicide. To place a skilled Army surgeon in charge of a medical supply depot to look after the procuring and distribution of medical and hospital supplies and the accounting thereof is wasteful of his special talent that may be sorely needed elsewhere. The military surgeon has more than enough to do to attend to the strictly medical needs of the sick and wounded and to make the necessary examinations and reports, and the medical profession is asking for skilled and adequate assistance and for relief from the non-medical work imposed upon the medical corps.

So far there has been no attempt to mobilize the pharmaceutical asset of the nation and to organize this into a pharmaceutical corps that will give to our soldiery a proper medical dispensing service; a service worth having. The responsibility for this failure to use

so valuable an asset should be fixed. The department must explain to the satisfaction of the citizens of the United States why their kinsmen and loved ones whom they are sacrificing to the cause of the nation are not receiving the same care, attention and the scientific, hygienic and pharmaceutical service that has been provided for the soldiers in the modern armies of both our allies and enemies.

Pharmaceutical Service in the Foreign Armies.

No one has, as yet, estimated the percentage of mortality in the Army resulting from improper and inefficient medical service. If such be attempted the figures will probably be appalling. The statistics that have been compiled, however, show that in the past wars, the number of men dying from disease was many times that killed by the enemy. "During the Civil War, the Union Army lost by deaths from disease 182,216 and 93,369 were killed." "In the Spanish-American War of 1898, only 454 Americans were killed and 5,277 died from disease."

In the Russo-Japanese War, the Japanese demonstrated the life-saving value of a scientific and systematically organized medical department, and the remarkable reduction of mortality from disease and wounds during that war attracted world-wide attention.

In the present World War, Germany reports that 87 per cent. of her wounded are returned to the service. This remarkable conservation of life is very properly attributed to her highly trained medical and pharmaceutical corps and accounts very largely for the ability of the Germans to keep up their vast armies.

The pharmaceutical service in the German Army was completely reorganized in 1902. Since that date, the pharmacists, in addition to performing purely pharmaceutic duties, have been given charge of the hygienic, chemical and research laboratories of the Army and each ranking officer in the Pharmaceutical Corps must have taken special chemical instruction and qualified as a food and drug chemist.

The cadre of the corps is always maintained and the reserves are available for service in time of war need. While in the early part of the year 1913, the total number of commissioned pharmacists in both the Army and Navy was reported as only 85, this was very rapidly increased when the war was entered upon and in De-

cember, 1914, there were 1,500 commissioned pharmacists in the Army alone.

The commander of the German Army Pharmaceutical Corps is the *Oberstabs-Apotheker* and he is attached to the Medical Section of the Prussian Minister of War and has rank equivalent to that of a general of brigade.

Each army corps has an associated sanitary corps under the control of an apothecary officer (*Stabs-Apotheker*) who has charge of the pharmaceutical service and supplies and is the director of the laboratories connected with that corps. In Berlin, at the main Sanitary Depot, many of the medical and surgical supplies are manufactured under the pharmacists of the corps. Each army corps has likewise a supply depot and a manufactory of supplies to provide for the medicines and dressings for that corps and the pharmacist officer is specifically charged with keeping up supplies of these and the list of necessary medicines includes many important medicaments. While at the main supply depot, in Berlin, tablets, ointments, ampoules, bandages, sutures, plasters, etc., are manufactured in quantities the corps factory has many things to make.

France has perhaps the oldest attempt at organized army pharmaceutical service and shortly before the present war this was completely reorganized, and it is now given credit and lauded for the efficient services performed along many avenues including chemical services of great value to the civil as well as to the military authorities. The commander of the French Army Pharmaceutical Corps is called an Inspector and ranks as a Brigadier-General. The complete organization includes the titles of principal pharmacists, pharmacists, pharmacist-majors, assistant pharmacist-majors and with rank as colonels, lieutenant-colonels, majors, captains and lieutenants. When the French peace army of 500,000 men was rapidly increased to 3,500,000 trained soldiers, the pharmaceutical corps was automatically increased from the pharmacists in reserve, many of whom had already seen service and experience in the sanitary corps.

In January, 1915, over 1,200 of the mobilized pharmacists who had the necessary experiences and training were commissioned as first-class assistant pharmacist-majors with the rank of lieutenants. During the present war, the duties of the French Army pharmacists have been greatly extended so that to-day they are the chemists

and analysts of the Army, examining all water supplies daily, and all foods, and testing much of the industrial materials supplied, making the clinical and bacteriological examinations for the medical men and studying gas warfare and providing the scientific means for combating these ingenious barbarities of the enemy. In addition the Pharmaceutical Corps procures or manufactures all of the medical and surgical supplies and manufactures directly much of these materials.

In Spain, as early as 1813, the Military Pharmacy Corps was formed. Despite the several changes and reorganizations of the Sanitary Corps that have taken place in that country since that date, the organization has been continued and its work made more comprehensive and beneficial. Its personnel comprises inspectors, sub-inspectors, pharmacist-majors, pharmacists of the first class and pharmacists of the second class and with commissioned rank from colonel to lieutenant.

In Japan "the Army has a Sanitary Supply Department and the Director of this Department is equal in rank to a colonel, and wherever there is a barrack, it has a field hospital which has a Department of Pharmacy, and the director of this pharmacy is equal in rank to a lieutenant-colonel. The rank of the pharmacists in this army is from sub-lieutenant to a colonel." On a peace footing the Japanese Army Pharmaceutical corps numbered 110 commissioned officers divided as follows: 1 colonel, 3 lieutenant-colonels, 7 majors, 30 captains and 70 lieutenants. The salaries are stated to be from 500 yen for second lieutenant to 3,000 yen for the colonel.

In the United States we have at present *no pharmaceutical corps whatever*. We have no governmental manufacture of medical supplies for the army under the supervision of trained pharmacists. During the Civil War at a government laboratory established in Philadelphia, under the supervision of the late Prof. John M. Maisch, many of the medicines needed for the Union troops were manufactured with a saving of many thousands of dollars. We have no specially trained pharmacists to attend in any organized or authoritative manner to the compounding and dispensing. We have absolutely nothing that bears any semblance to a modern army pharmaceutical corps. Can the United States continue to ignore the value of the important services of the pharmaceutical corps in foreign armies and the potent lessons of efficient organization?

Unfortunately the United States, in this matter, has copied the methods of the British Army Medical Department, whose service has been denounced at home as "obsolete," "incompetent" and "inefficient." Great Britain and the United States are the only two prominent nations whose army medical service does not provide for an organized pharmaceutical corps.

In England this serious defect has been forcefully pointed out and the comparisons made with the well-organized and equipped medical and pharmaceutical corps of the continental armies have not been considered as at all creditable to their home government. The British government has recently commissioned pharmacists sent to France and information at hand indicates that England is likewise awakening to the necessity of availing herself of the special knowledge of trained phamacists. In the colonial Armies raised by Australia this step has already been taken and a pharmaceutical corps has been organized and controls the pharmaceutical service for its armies and likewise for the transport service. With the desire to learn fully the organization and work of the pharmaceutical corps in the various armies, the Australian government has deputized Major Cossar of its pharmacy staff to make a special tour of study among all the allied armies.

The bill introduced by Mr. Edmonds will provide the machinery needed for the establishment of this desirable innovation and improvement in the medical service of the American Army. By establishing a system, it will provide for a reserve corps and for the automatic extension of the service in time of war. It provides for the various duties, qualifications, grades, studies and advancement of those entering the service. The very moderate rank provided for in this act, ranging from major to lieutenant, should be extended so as to advance the status of the head officer of the corps to the rank of colonel.

As the United States Army is now being reorganized in conformity with the organization of the French Army, is it not, likewise, an opportune time to organize a pharmaceutical service copied after their excellent plan?

GEORGE M. BERINGER,
President National Pharmaceutical Service Association,
SAMUEL L. HILTON,
Chairman, Committee on Status of Pharmacists in Government Service, American Pharmaceutical Association.

BRIEF SUBMITTED BY PHILADELPHIA DRUG EXCHANGE.[1]

COMMITTEE ON MILITARY AFFAIRS,
HOUSE OF REPRESENTATIVES,
HON. S. HUBERT DENT, *Chairman,*
Washington, D. C.

Gentlemen: In re subject of legislation to establish a commissioned pharmaceutical corps in the U. S. Army:

The text of this sermon—and it is a brief one—is "Safety First."

I hold in my hand the official "drug table" or "list of staple medical and surgical supplies" authorized by the Secretary of War for use in the Army hospitals. It gives the "*minimum* number of articles essential to the conduct of the nation's medical activities" and specifies the various quantities and kinds of containers that may be ordered by the Army drug stores from the general supplies. It embraces 406 drugs and drug products, 26 pills, 53 tablets and tablet tributes, 31 unofficial tablets, 27 hypodermic tablets, 10 ampoules 10 miscellaneous items and 14 biological products, or a total of 577 items. Of these 200, or over one third, are the most deadly poisons known to man.

For example, the Army drug stores contain diluted hydrocyanic acid. This deadly poison is exceedingly rapid in action. One and a half grains of the anhydrous acid is capable of producing death in the human subject (Christison). One or two drops of the acid will kill a vigorous dog in a few seconds (Wood). The famous chemist, Scheele, who discovered hydrocyanic acid, was killed by the vapors set free in the breaking of a flask of the liquid (Sollmann). The fatal dose of the official acid (2 per cent.) is 45 minims (Taylor). Each Army drug store may contain enough of the official acid (8 fluid ounces) to kill 80 soldiers.

Arsenic is in the Army drug stores, also. In overdoses it acts with very great energy and destroys life in a short time. It was at one time used very extensively for criminal poisoning, especially in the seventeenth century. An Italian woman, Toffania, carried this science to its greatest refinement. She killed dogs with arsenic and then used the saliva of such dogs (which contained arsenic) as a

[1] Presented at hearing on the Edmund's Bill held March 19, 1918.

means of killing human beings. The fatal dose of arsenic is upwards of 1.5 grains (Sollman). Each Army drug store may contain enough arsenic (8 ounces, ap.) to kill 2,500 soldiers. There may be, also, enough sodium arsenate (16 ounces, ap.), a soluble compound of arsenic (the fatal dose of which is about 2.5 grains), in each such store, to kill 3,000 soldiers more.

Corrosive sublimate is in the Army drug stores, also. It is a violent, corrosive poison. The fatal dose is 0.18 Gm. (Sollmann), or about 2¾ grains. There may be enough corrosive sublimate in each Army drug store (16 ounces, ap.) to kill 2,800 soldiers.

Carbolic acid is in the Army drug stores, also. It is a powerful, irritant poison, causing, in overdoses, great agony and suffering. Suicidal poisoning by it is extremely common. The minimum fatal dose is 150 to 225 grains (Sollmann). There may be enough carbolic acid in each Army drug store (80 ounces, ap.) to kill about 200 soldiers.

Strychnine sulphate is in the Army drug stores, also. This is a violent poison, causing, in overdoses, intense agony, convulsions and death. It is one of the most commonly used poisons, both for suicidal and criminal purposes. It is used, also, in the West, for the destruction of wolves. The smallest fatal dose to man is ½ grain (Sollmann). There may be enough strychnine sulphate in each Army drug store (¼ ounce, ap.) to kill 200 soldiers, in addition to the thousands of strychnine tablets allowed, as well as tincture of nux vomica (16 fl. oz.), which contains strychnine, to kill many more.

Opium (powdered) is in the Army drug stores, also. It is a very frequent means of suicidal poisoning and accidental doses are not at all rare. The fatal dose of opium is about 45 grains, but as little as 3 grains have been fatal (Sollmann). There may be enough opium in each Army drug store (8 ounces, ap.) to kill 150 soldiers, enough tincture of opium (16 fl. oz.) and tincture of deodorized opium (16 fl. oz.) to kill several score more, and enough morphine sulphate (5 ounces, ap.), the toxic dose of which is ½ to 6 grains, to kill 800 more.

The above-mentioned six poisons of each Army drug store have the potential possibilities of killing about 10,000 soldiers! The remaining poisons of the list represent still greater death-dealing possibilities.

These illustrations are typical and could be multiplied if neces-

sary but they suffice to show the serious possibilities of the 200 poisons out of the nearly 600 drugs contained in each Army drug store and the imperative necessity of placing Army pharmaceutical practice in the hands of legally qualified pharmacists, and not in the hands of men that no State Board of Pharmacy could possibly recognize as being legally competent.

It is a remarkable fact that, in the Army Medical Department, there is no "regulation" that physicians *must* use trained pharmacists for the performance of pharmaceutical duties, and in consequence they may and do delegate the preparation, compounding, dispensing, and in some cases the administration of the drugs and poisons they order for their soldier-patients to barbers, blacksmiths, undertakers and the like, while trained pharmacists in the same hospital perform non-pharmaceutical duties.

The result of such a system, or lack of system, is that mistakes must occur, even if not recognized. Physicians are not pharmacists. They know nothing about technical pharmacy. They have not been trained to differentiate between poisons and non-poisons by physical and chemical tests, although they should be competent to do so clinically (and then it may be too late), and when their untrained assistants make a mistake and dispense a poison for a non-poison, the patient suffers and perhaps dies and the "mistake" possibly is buried with him. The toxic symptoms of certain poisons resemble the symptoms of certain diseases. Thus: The symptoms of arsenical poisoning may be mistaken for gastro-enteritis, diarrhœa, etc., those of corrosive sublimate poisoning for dysentery, those of strychnine sulphate poisoning for tetanus, spinal meningitis, etc., and those of opium poisoning for alcoholism, uræmia, etc.

The danger of such untrained service is not only one of commission, but also one of omission. Not knowing the proper methods of preparing, compounding and dispensing drugs and not having competent pharmaceutical help, Army physicians go in the direction of the least resistance (and safety) and "muddle through" by making the patient fit the remedy and not the remedy fit the patient. The consequence is that the soldier-patient fails to receive adequate and properly individualized treatment, and his recovery to health, if there be recovery, is more or less seriously delayed.

The Army physician is *not* to be blamed for this condition of affairs. He is the victim of an antiquated system of Army pharmaceutical practice such as is not tolerated abroad in the armies of

France, Germany, Italy, Japan and other countries. And he is doing the best he can under very untoward circumstances.

In official Army medical circles, the claim is made that pharmacy is a "non-essential specialty," so far as the Army is concerned, and that, therefore, pharmacists could serve the Army only in a limited, special capacity.

The answer to this is, of course, that scientific pharmacy, such as is required, for example, in the preparation, compounding and dispensing of the drugs contained in the "drug table" of the Army hospital, is just as essential in military life as it is in civil life.

The official "drug table" referred to is now the vade mecum of the Army physician. It is an excellent work, so far as it goes, embracing a large proportion of the drugs and drug products of the U. S. Pharmacopœia and National Formulary. But rarely can these articles be prescribed alone. They must be given, as a rule, with diluents, flavors, excipients, etc., and yet we learn through a high medical authority at Washington, D. C., that "Many (medical) men feel that there is no need of pharmaceutical workers in the Army, inasmuch as the use of the 'drug table' is the proper procedure when prescribing."

If it is the proper procedure to use such a "drug table," and no one questions this, it is equally proper that its articles, when prescribed, shall be compounded and dispensed with proper pharmaceutical skill.

The importance of pharmaceutical service in the Army is shown by the fact that provisions are now being made for 250,000 hospital-beds for sick and wounded American soldiers and yet it is alleged that pharmacy is not essential in the Army.

In addition, clinical laboratory analysis, such as chemical, microscopical, bacteriological and radiographical work by trained pharmacists, would be an invaluable diagnostic aid to physicians in Army hospital practice.

The possibilities of the poisoning of soldiers by men who have had no technical training in pharmacy is sufficient, alone, to justify the establishment of a scientific, properly systematized, pharmaceutical corps in the Army. *"Safety First" is the American soldiers' first right in medical treatment.*

If pharmacy is the non-essential specialty claimed by the Medical Department, why is it that the Medical Department recently had transferred to it (Nov., 1917), by the War Department, as en-

listed personnel, all the drafted men in the Army who have had pharmaceutical training? Was it to secure professional services on the basis of a non-commissioned rank, or was it to side-track the movement to have established a commissioned pharmaceutical corps in the Army, or both?

We believe that the vast majority of physicians in the Army would prefer to have at their command, in practice, the same specialized highly trained pharmaceutical service they had in civil life before they entered the Army, and with professional rank, and that this is the attitude, also, of the great body of physicians of the whole country is shown by the following editorial from the *Journal of the American Medical Association:*

"Physicians, dentists and veterinarians are officially recognized by the government as men of special training, whose technical knowledge can be of use to the nation in time of war. Provision is made so that men in these three professions can be enrolled as commissioned officers and their skill thus most efficiently used by the Army. The pharmacist, however—as a pharmacist—is utterly ignored. If he enlists he does so as a private. So far as official recognition of it is conceived, the science and art of pharmacy might not exist in the Army. To-day, as never before, victory in war goes to the nation that most effectively conserves the health of its fighting men. The physician is now of such military importance that the medical profession will be called on to make no inconsiderable sacrifices. It will materially lighten the arduous duties and responsibilities of the physician to have in the Army trained pharmacists who will be able to give intelligent coöperation. But it is imposing too great a strain on the patriotism of those whose special knowledge is obviously a large asset to the Army to expect them to enlist as privates without any recognition of their importance, first, because it is but simple justice to the pharmacists themselves, secondly because the usefulness of the medical corps will be greatly augmented and lastly, and most important, because the efficiency of the Army demands it."

The value of trained pharmaceutical service is universally recognized in civil life. Every one of the forty-eight states of the Union has a State Pharmacy Law operated under a State Board of Pharmacy, and in each of these states, the raison d'être for the enactment of such a law has been the protection of the public against the dangers of incompetency or worse in the preparation, compounding and dispensing of drugs, particularly poisons; it is required in every state that those who wish to practice pharmacy must show their knowledge of drugs and poisons and demonstrate their competency to prepare, compound and dispense the same.

Shall the men who are now serving this country in its hour of

greatest need, who are offering their bodies, if necessary, as a sacrifice that the nation may live, be given *less* protection against the dangers—the serious dangers—of incompetent pharmaceutical service than they had in civil life before they enlisted in the Army? The answer rests with you, gentlemen!

PHILADELPHIA DRUG EXCHANGE,
(Signed) J. W. ENGLAND,
Secretary.

ARGUMENT OF DR. J. MADISON TAYLOR IN FAVOR OF A PHARMACEUTICAL CORPS IN THE U. S. ARMY.[1]

COMMITTEE ON MILITARY AFFAIRS,
HOUSE OF REPRESENTATIVES,
HON. S. HUBERT DENT, *Chairman,*
Washington, D. C.

Gentlemen: We physicians who appear before your committee would count ourselves blameworthy in advocating the establishment of a Pharmaceutical Corps in the military service, did we not believe on good authority we were rendering an important service to the nation and the nation's defenders.

In the forward press of advance in social and national welfare, the science of pharmacy, and in particular the present qualifications of pharmacists, may not yet be appreciated. They no longer are mere vendors or purveyors of drugs, they constitute a learned profession demanding of themselves a scientific training and equipment competent to meet the demands of modern medical, surgical and sanitary science. Among their ranks are numbered a large proportion of highly educated experts in many of the same fundamental lines on which the profession of medicine is advancing. They now constitute a powerful and effective national organization of research workers, of chemists, of biologists, of physiologists, of toxicologists, of serologists, of bacteriologists, devoted to the elucidation of the more obscure but essential problems concerned in conserving and saving human life.

They cover, and cover well, a domain which the medical profession cannot devote their time to, since pharmaceutic purposes are to perfect the instrumentalities and agencies surgeons must find

[1] Presented at hearing on the Edmonds Bill, H. R. 5531, March 19, 1918.

ready to hand and in perfect condition to apply instantly in ever-widening clinical problems in any line of specialization. During stress of overwhelming work these skilled technicians, thoroughly trained in chemical and manipulative niceties, will prove invaluable.

Of course, the number of these exceptionally educated men is still limited. They are increasing every year. Requirements in the schools of pharmacy are being rapidly raised. They aim to produce a group of men just as highly educated in their domain as are the medical students in theirs.

The preliminary educational requirements are also now much higher than was the case only a few years ago. In contrast with what these requirements were twenty or thirty years ago, modern pharmacy graduates are incomparably superior. In fact, primary requirements for the pharmacist today are equivalent to those for medicine in many states.

A point I wish to emphasize is that: "Many of the subjects pharmacists are required to study are the same as many of those the medical students pursue. They overlap, constituting a close association, an interdependency with scientific medicine."

They have become so necessary to the profession of medicine that they supplement in essential particulars all the advances of medicine, each having a definite domain, yet fully interrelated and interacting. "As the string unto the bow is," so is pharmacy to medical science at its best.

Let it be clearly understood that these pharmacists, while originally, and still to a large extent, merchants and manufacturers of drugs and remedies, number among them groups of research workers so highly trained as to be fully qualified to bear similar, indeed, equal, responsibility with physicians.

It is, of course, desirable that in making selection of pharmacists for military service, examinations shall be as exacting as shall meet the requirements of examining boards of the Army and Navy. Hence, the protection of the service, hence the welfare and lives of the enlisted men and officers, will be amply secured.

I am credibly informed that those pharmacists who now qualify and who seek military service must often surrender positions which remunerate them many times over what they would receive in service pay. Hence, their aim is a patriotic, not a selfish one. They expect rank for the purpose of securing attention and exercising authority within their domain.

Among the particular services a specially educated pharmacist could render are these:

He could supplement and contribute to the correlating data for the surgeon, in short in the "paper work."

He could perform a large part of the clinical laboratory work, urinalyses, blood examinations (morphologic or pathologic), in cytology, serology, vaccine preparation, bacteriology in the preparation of microscopic slides; in the examination of gastric contents, feces, exudates, transudates, and the like.

He could apply tests such as Wassermann, Noguchi, Widal, etc., all chemical procedures; he could keep all the material for these tests up to date.

He could supplement in X-ray work; keep the mechanisms of Rœntgenology in order, print plates, etc.

Many chemical problems arise in connection with poison cases. He could prepare all special materials for such procedures as hypodermoclysis, blood transfusion, Carrel-Dakin solution, etc. He could examine water, water supplies, all articles of food and drink, milk, meats and the like, which must be critically estimated.

Those who desire to become candidates for military service are already seeking instruction and experience in meeting minor surgical and medical emergencies, in the dressing of wounds, in the adjustment of dressings, solutions.

One surgeon and two pharmacists could probably do as much good work as two or even three surgeons.

The claim is made by the opponents of the Pharmaceutical Corps that the medicines or drugs used in the army are very simple and few, and served mostly in tablet form, readily handed out by any bright, alert enlisted man selected and trained for the purpose. How about the poisons? How many blunders are made by such an elementary form of dispensing? Full knowledge of the properties of death-dealing chemicals is an absolute essential for the man who handles them.

I have been credibly informed that the official Army Drug Table authorized by the Secretary of War comprises nearly 600 drugs and drug products of all kinds, *including poisons of the deadliest character.* Also that this drug table or list is admitted to be only the "minimum number of articles essential to the nation's medical activities."

Obviously the preparation, compounding and especially the dis-

pensing of such dangerous products demands trained pharmacists. Note the gravity of this problem, the hideous peril run by our home defenders by such haphazard distribution.

How many fatal blunders have occurred? How can the surgeon keep control of the leaks in the chain of procedures from bottle to patient? How many curious inexplicable causes of death?

Should an error be suspected by the enlisted man who dispenses poisons there is every temptation to keep quiet and thus escape blame. Clearly our home-defenders deserve fully as much special skill in the distribution of drugs as do our home-makers.

LESSONS TO BE LEARNED FROM THE HEARING ON THE EDMONDS BILL.

By Robert P. Fischelis,

Secretary National Pharmaceutical Service Association.

The hearing before the Committee on Military Affairs on the Edmonds Bill brought out some very interesting points, indicating clearly the impression that has been made on the minds of the members of the committee by the arguments advanced against the formation of a pharmaceutical corps.

A study of the questions which were asked by the committee seems to indicate that very little attention has been given by Congress to the need of proper pharmaceutical service in the army, and that most of the members believe the medical department is taking good care of this phase of army work. Inasmuch as their ideas of medicine center entirely around the doctor of medicine, many members of the committee were surprised to know that just because a man is a good physician he may not be able to compound medicines. It was fortunate for the pharmaceutical representatives to be afforded an opportunity to explain what pharmacy really is and what kind of training its practice requires.

It was very apparent early in the hearing that some of the members of the committee felt that the Edmonds Bill was a selfish measure designed only to provide commissioned rank for pharmacists. The indications at the end of the hearing were that at least this thought had been somewhat dispelled in the minds of the committee.

Some of the Congressmen wanted to know why a pharmacist could not serve just as well as an enlisted man as he could as a commissioned man, and wherein the health of the boys in the army would be improved if commissions were granted to pharmacists. In answering this question, it was pointed out that in order to practice pharmacy properly the pharmacist must have authority; he must have sufficient standing in his community in civil life to converse intelligently with the physician and to take up with him matters regarding incompatibilities, etc. The army system prevents such close coöperation between pharmacists and physicians because of the distinction between commissioned and non-commissioned rank.

Another very important question that was raised concerned the number of commissions that would be required in order to supply enough pharmacists for our present army. The committee, in making its recommendation to Congress, is desirous of being specific in its statements, and wants to know how much increase in the expense of operation the formation of a pharmaceutical corps would require.

Every member of the committee was very much interested in the attitude of foreign governments toward their pharmacists, and many were surprised when they were told that the continental armies all have pharmaceutical corps which are doing very efficient work.

Some anxiety was expressed by one or two members as to the attitude of the manufacturing pharmacists toward the creation of a pharmaceutical corps. They believed that most of the medicines used were the "ready made" kind and simply required pouring the contents of one bottle into another. They overlooked entirely the present-day training of the pharmacist and his ability to render service in sanitation, bacteriology, etc. None of the pharmaceutical representatives who spoke before the committee touched sufficiently on this point. However, the committee granted the privilege to all of them of extending their remarks, and it is to be hoped that further information along this line has since been supplied.

What are the lessons to be learned from the attitude and the questions of the committee?

1. The pharmaceutical profession has been clearly shown that very few people know anything about the extent of training which the modern pharmacist receives. All judgment regarding pharmacy is based upon the average corner drug store, and even there surface conditions only are taken into consideration. The average layman sees nothing in a drug store except a service station for all sorts of

accommodation, and a place where drugs and many things unrelated thereto are sold. The scientific nature of the business is in the background and is therefore not impressed upon the layman. Congress consists essentially of laymen, who in turn represent the large group of people having the foregoing opinion regarding the druggist and pharmacy.

What, then, could be expected from the Committee on Military Affairs or Congress itself excepting an attitude such as was displayed?

The remedy is to educate the public and its representatives in Congress to the far-reaching possibilities of pharmacy and the work which the pharmacist can do. Since large bodies move slowly, it takes a long while to accomplish in a short time something that has been neglected for decades. However, the time is opportune and our propaganda work must continue, and continue with increased rather than diminished vigor.

2. It was plain to be seen that if a pharmaceutical corps were desired merely to give the pharmacist commissioned rank, little or no support could be expected for the measure. If the Edmonds Bill is passed it will be because Congress has been convinced that the men in the army are not now receiving the kind of pharmaceutical service they deserve. All of our propaganda work must, therefore, eliminate the selfish factor, forgetting that the pharmacist deserves a commission, and working on the basis that the men in the service deserve full utilization of the ability of the pharmacist in order to increase their chances of being returned from the army to civil life unharmed.

3. We must allay the fears of those connected with the medical department, as well as those who are providing army legislation, that pharmacists expect to antagonize the medical officers of the army or attempt sweeping reforms which would materially upset the service. We must emphasize the fact that a pharmaceutical corps will fit in with the present army scheme and increase the efficiency of the medical department without upsetting the organization. This is a difficult task, but if it is handled tactfully it can be accomplished. There is no desire on the part of the pharmacist to get in and destroy; his only desire is to be given an opportunity to coöperate.

Bearing these lessons in mind, the course for pharmaceutical associations and individuals to follow is very plain. There should be coördination and continued propaganda, and whatever pressure is

exerted should be directed through the same channels and along the same lines. In that way we will make everyone's "bit" count. Very little can be looked forward to, however, if one group pulls one way and the other in the opposite direction. Fortunately, we have thus far had very little work at cross purposes and it is to be hoped, with the coming of the various pharmaceutical conventions, coöperation will be even greater and that at least once the pharmaceutical profession will be found united in advocating a measure which, if passed, will do more to place pharmacy on a professional basis than any other single thing that has ever been accomplished.

SOME POSSIBLE PHARMACEUTICAL USES OF PARA-DICHLORBENZENE. A PLEA FOR THE USE AND FURTHER INVESTIGATION OF A BY-PRODUCT RESULTING FROM THE WAR.

By W. A. Konantz, Research Chemist, College of Pharmacy, University of Iowa, Iowa City, Ia.

In the chlorination of benzene at ordinary temperatures about 85–90 per cent. of monochlorbenzene and 10–15 per cent. of dichlorbenzene, chiefly para, are produced. At the present time, enormous quantities of benzene are being chlorinated, for it has been found that picric acid can be made more cheaply from monochlorbenzene than from phenol. At the same time, however, large quantities of dichlorbenzene are accumulating, for which there is very little demand. For the complete success of this most valuable process of manufacturing picric acid, it is necessary that uses be found for the dichlorbenzene. Owing to the firmness with which the chlorine atoms are attached to the benzene nucleus, p-dichlorbenzene does not enter readily into chemical reaction, and all attempts to convert it into other commercially valuable compounds have so far been unsuccessful. The physical properties of this substance are such, however, that the writer believes it may prove of considerable value in pharmacy. Some possible pharmaceutical uses which have occurred to the writer are here described in the hope that pharmacists and manufacturers will try them out and so help to solve the problem of utilizing this by-product.

From the viewpoint of the pharmacist the most valuable prop-

erty of p-dichlorbenzene, and the one upon which most of its pharmaceutical uses will undoubtedly be based, is its powerful destructive action on certain lower forms of life. Galewsky, who studied the relative efficiency of many substances as moth exterminators, reported[1] that p-dichlorbenzene is the most effective agent for this purpose, being superior to naphthalene, which is generally used. Many tons of p-dichlorbenzene could, undoubtedly, be disposed of annually in the form of moth-balls, moth-powders, moth-solutions, moth-paper, etc., if it were properly pushed. In physical properties p-dichlorbenzene resembles naphthalene very closely. It occurs as transparent, colorless flakes, somewhat unctuous to the touch, and of a faint, rather agreeable, camphor-like odor. It melts at 53° C. and boils at 172° C., the corresponding constants for naphthalene being 79° C. and 218° C.; it is, therefore, more volatile than the latter. Besides its greater efficiency as a moth exterminator, p-dichlorbenzene has the added advantage over naphthalene that the odor can be more readily removed from garments with which it has been packed. Strips of cloth saturated with a concentrated solution of p-dichlorbenzene in gasoline and dried, lost the odor completely after several hours of airing in the sun. The writer further finds that p-dichlorbenzene can be easily compressed into tablets with an ordinary tablet machine and that it can also be readily formed into balls by melting and pouring it into molds. On the whole, p-dichlorbenzene seems excellently adapted for use as a moth-repellant, and as it can probably be bought for less than naphthalene it deserves to supplant the latter for this purpose. The writer earnestly recommends that pharmacists and manufacturers introduce and push it as a moth exterminator.

The effect of p-dichlorbenzene on moths suggests that it may also be of value in exterminating or repelling other pests. Dissolved in benzine or any other suitable solvent and applied as a spray to the joints of woodwork, to clothing which has been attacked, and to other articles, it may prove effective against various insects, bedbugs, roaches, ants, flies, etc., and their eggs or larvæ. On account of the inflammability of benzine it may well be replaced by carbon tetrachloride as a solvent, as the dichlorbenzene is very soluble in this liquid, as it also is in alcohol, ether, chloroform and benzene. Solutions of p-dichlorbenzene may also prove useful against vermin on animals and birds, and as a spray for plants.

[1] *Z. Textil. Ind.*, 1915, 506.

It is also possible that the insecticidal and antiseptic properties of p-dichlorbenzene may render it applicable in the treatment of certain skin diseases. The writer finds that it is very soluble in petrolatum, lard, and many fixed and volatile oils, and large quantities of it can be easily incorporated by simply stirring it into the melted base.

Many other uses for p-dichlorbenzene than those which have here been briefly mentioned may suggest themselves to those who will give the subject a little thought and carry out a few experiments. The attention of pharmacists and manufacturers has been called to this problem because it is nationally as well as commercially important that it be solved as soon as possible. It is hoped that those who work on the problem will publish their results, even though they may be negative, in order that the greatest possible good may come of their efforts. The writer will be glad to give such assistance as he can to any one who is interested.

URINARY ANTISEPSIS.[1]

A Study of the Antiseptic Properties and the Renal Excretion of Compounds Related to Phenolsulphonephthalein: Preliminary Report.*

By Edwin G. Davis, M.D., Resident Urologist, Johns Hopkins Hospital, Baltimore.

The ideal internal urinary antiseptic must be a drug which is chemically stable, nontoxic, and nonirritating to the lower urinary tract; which is antiseptic in high dilution (in urine, as well as in water), and which is eliminated unchanged in high percentage by the kidney. There is no such drug known. A consideration of the properties possessed by phenolsulphonephthalein, however, shows that this compound comes very close to filling all these requirements. Phenolsulphonephthalein is chemically stable, nontoxic and nonirritating, and is eliminated by the kidney with incredible rapid-

[1] Reprinted from The Journal of the American Medical Association, March 2, 1918.

* From the James Buchanan Brady Urological Institute, Johns Hopkins Hospital.

ity and completeness; but it has no antiseptic properties, excepting in water in its free acid form. (Clinically it is used as the monosodium salt.) This remarkable compound, synthesized in 1898 by Sohon,[1] at Remsen's[2] suggestion, investigated later in Abel's[3] laboratory, and introduced into clinical use by Rowntree and Geraghty[4] twelve years later, has become the basis of the most widely used and the most satisfactory of all the tests of renal function. This is due to the remarkable rapidity and completeness with which phenolsulphonephthalein is eliminated by the kidney, and to its nontoxicity. Rowntree and Geraghty have given 1 gram doses to dogs without evidence of renal injury. Its marvelous rapidity and completeness of elimination is realized when one considers that a 6 Mg. dose, given intravenously, and therefore diluted about a million times by the blood stream, appears in the bladder in about two minutes; and, after one hour, from 60 to 70 per cent. has been excreted by the normal kidney. Furthermore, about 30 or 35 per cent. of this amount appears during the first fifteen minutes, and about 40 or 50 per cent. during the first half hour. In view of these remarkable properties, it was thought worth while to attempt a modification of the phenolsulphonephthalein molecule, with the hope that an antiseptic compound might be produced which still retained the properties of the original drug. As the problem gradually increased in scope, it was found advisable to investigate a large number of compounds distantly related to phenolsulphonephthalein, as well as those closely related. The total number of compounds experimented with at present is about 195, the antiseptic properties of which will be enumerated in subsequent publications. This is a preliminary report dealing only with compounds closely related to phenolsulphonephthalein.

These compounds were not easily obtained. The original few were supplied by Mr. H. A. B. Dunning, of Hynson, Westcott and

[1] Sohon, M. D., "An Investigation of Some Derivatives of Orthosulfobenzoic Anhydride," *Am. Chem. Jour.*, 1898, 20, 257.

[2] Remsen, I., "On a New Class of Compounds Analogous to the Phthaleins," *Am. Chem. Jour.*, 1884, 6, 180.

[3] Abel, J. J., and Rowntree, L. G., "On the Pharmacological Action of Some Phthaleins and their Derivatives, with Especial Reference to their Behavior as Purgatives," *Jour. Pharmacol. and Exper. Therap.*, 1909, 1, 231.

[4] Rowntree, L. G., and Geraghty, J. T., "An Experimental and Clinical Study of the Functional Activity of the Kidneys by Means of Phenolsulphonephthalein," *Jour. Pharmacol. and Exper. Therap.*, 1909, 1, 579.

Dunning, and by Clark and Lubs, of the Bureau of Animal Industry, Washington. Other compounds, made and donated through the courtesy of Dr. J. H. Sachs, of the graduate department of chemistry, Johns Hopkins University, and still others, obtained here and there from various sources, supplied sufficient material for the first few months of investigation, and gave very interesting results. During the past year, however, the work has been carried out, and is at present being continued, with the collaboration of Dr. E. C. White, chemist in the Brady Urological Institute. A more detailed report, including tables of antiseptic values and rates of excretion, and with discussion of the chemical phases, will shortly be published as a joint article.

Although the literature contains no record of any attempt to synthesize an internal urinary antiseptic, various workers (following the pioneer work of Ehrlich in chemotherapy) during recent years have attempted to correlate chemical structure and physiologic action, and thus produce compounds with a desired specific therapeutic action. It is not my purpose to discuss this literature. For an excellent summary of recent work done along the lines of chemotherapy, the reader is referred to publications of Lewis.[5] The problem which Lewis and his co-worker, Krauss,[6] are investigating is analogous to the problem on urinary antisepsis outlined above, in that they started with a dye (trypan red) which possesses the peculiar property of becoming localized in the caseous centers of tuberculous masses, and experimented with numerous modifications of this compound, with the hope that one might be produced that would inhibit the development of the tubercle bacillus, and still retain the localizing tendency of the original compound.

Limited space does not permit a discussion of the so-called urinary antiseptics in present use, and of the great need of a really efficient drug for this purpose, which may be given either intravenously or by mouth and which will cause an inhibition of bacterial development in the urine, regardless of the reaction of the latter. For a complete summary of this phase of the subject, and a discus-

[5] Lewis, P. A., "Observations Bearing on the Possibility of Developing an Experimental Chemotherapy of Tuberculosis," *Bull. Johns Hopkins Hosp.*, 1917, 28, 120; "Chemotherapy in Tuberculosis," *Am. Jour. Med. Sc.*, 1917, 153, 625.

[6] Krauss, R. B., "The Preparation of Compounds of Trypan Red with Iodin and Other Substances," *Jour. Am. Chem. Soc.*, 1914, 36, 961.

sion of the relative values of the various urinary antiseptics in common use, the reader is referred to the paper published by Hinman[7] in 1915. This paper will be freely quoted. Of the urinary antiseptics in common use, hexamethylenamin is by far the best, but has very definite limitations, owing mainly to the fact that an acid medium is essential for the liberation of formaldehyde. Furthermore, "the necessity of concentration, and time for the accumulation of formaldehyde in antiseptic amounts, largely destroys the value of the drug for kidney antisepsis; for bladder antisepsis in cases with polyuria or frequent urination, except when retention in some form is present; in cases of urinary fistula, notably postoperative prostatics during the period of incontinence, and in cases with continual bladder drainage as in true incontinence or with retention catheter; and for urethral antisepsis no matter what the infection. The greatest usefulness of hexamethylenamin is in bladder prophylaxis in cases in which the above urinary conditions are not present. . . . Methylene blue, in a dilution of 1:150,000, will inhibit the growth of staphylococci," and would therefore seem of value in this type of infection; but there has been no experimental work showing that methylene blue does not undergo modification either in the blood stream or in the urine so as to lose its antiseptic value, which will be shown below to be the case with many other compounds. Hinman states that "the value as internal urinary antiseptics of other substances such as salol, oil of sandalwood, salicylic, boric and benzoic acids, is very limited," and concludes that there is no known drug with properties even approaching those of an ideal urinary antiseptic.

As stated before, an ideal internal urinary antiseptic must be chemically stable, nontoxic, antiseptic in urine (as well as in water), and must, like phenolsulphonephthalein, possess the property of high-percentage elimination. Possibly a compound not entirely nontoxic, but relatively so, might be suitable for the purpose. Provided the renal elimination of a given compound is sufficiently rapid and complete, and that this compound causes bacterial inhibition in urine in sufficiently high dilution, it is conceivable that small doses might serve to produce urinary antisepsis, even though the compound is moderately toxic. In view of the general toxic effects on the animal organism that an antiseptic compound may be expected to have,

[7] Hinman, Frank, "Urinary Antisepsis: A Clinical and Bacteriologic Study," *The Journal A. M. A.*, Nov. 20, 1915, p. 1769.

and the possibility of injury to the renal epithelium and of irritating effects on the lower urinary tract, one realizes the hopelessness of the problem if the synthesis of a completely harmless urinary antiseptic is the goal. The matter then resolves itself into a question of relative toxicity; that is, the attainment of a compound combining minimum toxicity with maximum efficiency, so that small but effective doses may be safely used.

Methods of Injection.

Each compound was investigated with two objects in view: first, to determine the rate of elimination by the kidney, and second, to determine the antiseptic properties. Rabbits were used for injection purposes because (1) they are easily available and cared for in large numbers; (2) the ear vein is easily injected, and (3) the urethra of the male rabbit is large and easily catheterized. The drugs were injected intravenously in 10 Mg. amounts in 1 per cent. solution, and the rabbits catheterized after one hour. In the case of each drug a colorimetric estimation of percentage of excretion was made with the Hellige colorimeter, 10 Mg. of the drug diluted in 1,000 Cc. of water being uesd as a standard. In order to make certain that the total excretion for one hour was quantitatively recovered, the bladders of the rabbits were irrigated after catheterization, and the irrigation added to the urine obtained through the catheter. The percentage of excretion of each compound was estimated by averaging the results of at least two injections on different rabbits. It would have been impossible to determine the rate of excretion of such a large number of compounds had it not been that nearly all of them were highly colored and hence readily detected in the urine. Colorless compounds were rejected, excepting a few in which the antiseptic tests were unusually promising.

Bacteriologic Technic.

Antisepsis in urine is quite a different thing from antisepsis in water. As will be shown further on and in subsequent papers, there are numerous compounds which are germicidal in high dilution in water, but which lose this property entirely when diluted in urine and which even permit the growth of organisms in urine when in relatively strong concentration. This astonishing fact has proved

to be a great obstacle. It may be readily seen that the compound, the antiseptic power of which is due to its acid or basic properties, would become inert in urine on account of the buffer[8] value of the urinary salts. Other compounds, containing ionic silver, become inert in urine because the silver is precipitated by the chlorids. There remain, however, a large number of drugs whose loss of antiseptic strength in urine is due to some unknown interfering action, the nature of which is as yet undetermined. It must not be understood that this loss of antiseptic power in urine is noted after the compound has been passed through the animal body, but it occurs when urine is added to the aqueous solution of the compound in a test tube. For this reason it became necessary to carry on parallel germicidal tests both in urine and in water.

The colon bacillus was used throughout the experiments because it is the most frequent invader of the urinary tract, and because it is resistant to antiseptics, and is readily cultivated. Investigations with other organisms are to be carried on in the future. Each compound was studied with the view of determining (1) its germicidal properties (in water and in urine) and (2) its antiseptic or inhibitory properties in urine.

1. *Germicidal Test.*—In order to rule out a large number of undesirable compounds, it was necessary to establish an arbitrary standard of germicidal strength, and compare them all with phenol (carbolic acid). The arbitrary method chosen was the determination of the highest dilution of each compound which, in 1 Cc. amount, will kill one loop (3 Mm. internal diameter) of a twenty-four-hour broth culture of the colon bacillus, in one hour, at 37° C. Dilutions of the drug were made with sterile pipets in sterile test tubes, and all but 1 Cc. of each dilution was discarded. After the inoculation of each dilution with one loop of colon bacilli, and incubation for one hour, 0.1 Cc. of each dilution was transferred to melted agar, and plated. In transferring these 0.1 Cc. amounts, it was found convenient to use capillary pipets drawn out (from 3 Mm. glass tubing) long enough to reach the bottom of the test tubes. By connecting the large end of one of these capillary tubes

[8] The term "buffer" action refers to the ability of mixtures of certain acid and alkaline salts in solution to maintain a practically constant hydrogen ion concentration, in spite of the addition of moderate amounts of acid or alkali. For detailed discussion, see publications of Henderson and Palmer, Clark and Lubs, and Shohl and Janney.

to a carefully calibrated small syringe (by means of a small rubber tip), it was found that 0.1 Cc. amounts could be drawn up with remarkable accuracy, irrespective of variations in the size of the capillary tubes. These tubes were used over and over again, large numbers being sterilized together by means of dry heat.

Parallel tests were run for each compound, sterile water being used for one series of dilutions and sterile urine for the other. It was found to be unnecessary to adopt any method of sterilizing the urine to be used for this purpose. Agar plates poured each day containing 0.1 Cc. of urine taken from a specimen voided in a sterile (second) flask by a normal individual were uniformly sterile. The factor of possible error due to modification of the urine through the process of sterilization was thus eliminated. For example, sterilization of urine by heat produces a marked change in the hydrogen ion concentration, the urine becoming much more alkaline.

The effect of the reaction of the urine in aiding or hindering the germicidal activity of a drug is an all-important factor. Henderson and Palmer[9] have shown that the hydrogen ion concentration of urine is normally subject to a considerable range of variation (p_H 4.8 to p_H 7.4), and that the average of this range is p_H 6.0 on the hydrogen ion scale, corresponding to 0.000001 N acid.[10] The importance of the reaction of urine when used as a culture medium has been pointed out by Shohl and Janney, who find that the colon bacillus fails to grow in urine at certain definite acid (p_H 4.8) and alkaline (p_H 9.2) end-points. In order to eliminate possible error, due to strongly acid or alkaline urine, the hydrogen ion concentration of each specimen of urine to be used for antiseptic experiments was determined, and the specimen rejected if the reaction was not approximately that of average normal urine, that is, p_H 6.0.

2. *Antiseptic Test.*—More important than the determination of the germicidal strength of these compounds was the determination of the highest dilution of each in urine that will cause an inhibition of bacterial development. For this, dilutions in urine were made in 10 Cc. amounts, sterile test tubes being used. Each tube was inocu-

[9] Henderson, L. J., and Palmer, W. W., "On the Intensity of Urinary Acidity in Normal and Pathological Conditions," *Jour. Biol. Chem.*, 1913, 13, 393.

[10] For discussions concerning the hydrogen ion concentration of urine, and the technic for colorimetric estimation, see publications of Henderson and Palmer, Clark and Lubs, and Shohl and Janney.

lated (as in the germicidal test) with one standard loop of a twenty-four-hour broth culture of the colon bacillus, immediately after which 0.1 Cc. of each inoculated dilution was plated, as proof that the inoculation had been made, and for the purpose of comparison with a second plate which was poured (0.1 Cc. again being transferred) after the inoculated dilutions had been incubated for twenty-four hours at 37° C. The contrasting of these two plates, poured at twenty-four-hour intervals showed whether or not growth had taken place during the incubation period. The first plate (poured immediately after inoculation) usually showed about 10,000 colonies, roughly estimated. A second (twenty-four-hour) plate which was sterile or which contained very few colonies (less than 100) was considered proof of inhibition, while a plate showing countless numbers of colonies proved the absence of inhibition. In the vast majority of instances the contrast between Plates 1 and 2 was so marked that there could be no possible doubt. A daily control of inoculated drug-free urine invariably contained countless numbers of colonies in the second (twenty-four-hour) plate, showing that normal urine acts as a favorable culture medium for the colon bacillus.

Phenolsulphonephthalein and Salts.

The properties of phenolsulphonephthalein itself, and of some of its metallic salts (sodium, silver, copper, mercury and barium), as illustrated in the structural formula given in Fig. 1, were first investigated. Phenolsulphonephthalein, in its free acid form, although almost insoluble, is nevertheless germicidal (against the colon bacillus, according to the arbitrary standard described above) in a dilution of 1 : 10,000; that is, it has about fifty times the strength of phenol. In urine, however, even in almost saturated solution, phenolsulphonephthalein permits the growth and development of

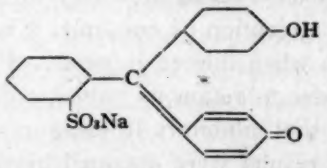


Fig. 1. Phenolsulphonephthalein (monosodium salt).

the colon bacillus. A suggested explanation of this loss of power is that the water solution kills by virtue of its acidity whereas in

urine the acid properties are lost on account of the buffer value of the urinary salts. Furthermore, the monosodium salt, the form used clinically, has no germicidal action even in water, and in urine permits the growth of the colon bacillus even in a 1:200 dilution. The silver salt is extremely germicidal in water (having 5,000 times the strength of phenol), but in urine the silver is precipitated by the chlorids, and the germicidal strength, due to the silver ion, is lost. The germicidal properties of the silver salt of phenolsulphonephthalein, both in water and in urine, correspond very closely to those of silver nitrate. The fact that the chlorids are responsible is shown by a similar disappearance of germicidal action when the dilutions are made in physiologic sodium chlorid solution. Furthermore, when the silver salt is injected intravenously, the ionic silver is lost in the body, and the phenolsulphonephthalein appears in the urine free from silver, probably as the sodium salt. Mercurous and mercuric salts and the cupric salt, although having some germicidal value in urine, were discarded because of their toxicity. The barium salt was quite inert.

Conclusion.—The metallic salts of phenolsulphonephthalein give no promise of value as urinary antiseptics.

Sulphonephthaleins.

The compounds listed in the accompanying table are all analogous to phenolsulphonephthalein, differing from the latter compound only by the presence of various substituent groups in the phenol nucleus. All of these compounds excepting two are practically insoluble in water, as the free acid, but are readily soluble in the form of the sodium salt. Pyrocatechinsulphonephthalein and guaiacolsulphonephthalein, however, are soluble in water without the addition of alkali. Some of these compounds are quite germicidal in water (possibly owing to excess alkali necessary to bring them into solution); but, with the exception of one only, it is a uniform rule that they lose this action when diluted in urine. Pyrocatechinsulphonephthalein, the only one to retain its value, is germicidal in urine in a dilution of 1:500, and inhibitory in urine in a dilution of 1:1,000.

Very surprising results were obtained by the injection of these compounds. Although they are all quite closely related chemically, some of them are eliminated by the kidney with the same marvelous rapidity and completeness with which phenolsulphonephthalein is

eliminated, while others appear in the urine only in traces or not at all. The excretion seems to be governed by no rule. With this class of compounds, no definite relationship between chemical structure and "renal affinity" could be established. The addition of methyl groups to the phenol nucleus (cresolsulphonephthalein) cer-

The Excretion and the Antiseptic Properties of the Sulphonephthaleins.

Name.	Antiseptic Strength.				Excretion Percentage After One Hour.
	In Water.		In Urine.		
	Kills in One Hour.	Fails in One Hour.	Inhibits Development.	Permits Growth.	
Phenolsulphonephthalein	.....	1:200	.....	1:200	70
Thymolsulphonephthalein	1:200	1:1,000	.....	1:200	Trace
Salicylsulphonephthalein	.....	1:200	.....	1:200	Trace
Hydrochinonsulphonephthalein	.....	1:200	.....	1:200	40
Cresolsulphonephthalein	.....	1:200	.....	1:200	70
Tetra-aminophenolsulphonephthalein	1:200	1:1,000	1:200	1:500	0
Alphanaphtholsulphonephthalein	1:200	1:1,000	.....	1:200	Unstable
Orcinsulphonephthalein	.....	1:200	.....	1:200	70
Pyrocatechinsulphonephthalein	1:2.000	1:5,000	1:1,000	1:2,000	0
Tetranitrophenolsulphonephthalein	.....	1:200	.....	1:200	Hemoglobinuria
Guaiacolsulphonephthalein	1:200	1:1,000	.....	1:200	Trace
Resorcinsulphonephthalein	.....	1:200	.....	1:200	75
Pyrogallolsulphonephthalein	.....	1:200	.....	1:200	30
Phenol	1:180	1:200	1:900	1:1,000	

tainly does not interfere with excretion, while excretion is prevented by isopropyl, amino and carboxyl groups, as shown by thymolsulphonephthalein, aminosulphonephthalein and salicylsulphonephthalein.

The most interesting and disappointing feature shown by the sulphonephthaleins is the effect of the addition of OH groups to the phenol nucleus. Pyrogallolsulphonephthalein, hydrochinonsulphonephthalein and pyrocatechinsulphonephthalein are all hydroxy derivatives, differing only in the number and position of the OH groups, and, of these, the pyrogallol and hydrochinon compounds are excreted, whereas pyrocatechinsulphonephthalein, the only sulphonephthalein shown to be antiseptic in urine, unfortunately, is also the only one not excreted.

Conclusions.—1. Several other sulphonephthaleins are excreted by the kidney with great rapidity, just as is phenolsulphonephthalein.

2. None of the sulphonephthaleins investigated would be of value

as urinary antiseptics, since the only one showing antiseptic strength in urine fails to be excreted.

Halogen Derivatives of Sulphonephthaleins.

To illustrate the chemical structure of the halogen derivatives of sulphonephthaleins investigated, the structural formula (Fig. 2) is given. Those investigated were tetrabromphenolsulphonephthalein, tetrachlorphenolsulphonephthalein, di-iodophenolsulphonephthalein, dibromcresolsulphonephthalein and dibromthymolsulphonephthalein. These compounds, all used in the form of the sodium salt, show moderate germicidal ability in water, probably owing to excess alkali necessary to bring them into solution; but they all become inert in

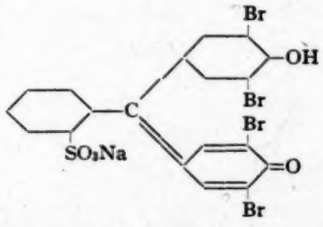


Fig. 2. Tetrabromphenolsulphonephthalein (monosodium salt).

urine. Furthermore, none of them excepting tetrachlorphenolsulphonephthalein are excreted, and we therefore have in compounds of this class a definite relationship between chemical structure and "renal affinity."

Conclusions.—1. Substitution of bromine in compounds of the sulphonephthalein type prevents excretion by the kidney.

2. Halogenated sulphonephthaleins give no promise of value as urinary antiseptics.

Phthaleins.

These differ from sulphonephthaleins in that a carboxyl group replaces the sulphonic acid group, as shown in the formula (Fig. 3). Those investigated were phenolphthalein, thymolphthalein, tetrabromtetrachlorphenolphthalein tetraiodophenolphthalein, phenoltetrachlorphthalein and sulphonated phenolphthalein. None of these compounds were antiseptic in urine, nor were any of them excreted by the kidney, excepting the sulphonated phenolphthalein. It is interesting to note that the sulphonation of phenol-

phthalein gives a soluble compound (phenolphthalein sulphonic acid), the sodium salt of which is excreted almost as rapidly as is phenolsulphonephthalein. The similarity of names, however, between this compound and phenolsulphonephthalein should not give the impression that the two are the same. They differ in composition, structure and method of preparation. Since the sulphonation of phenolphthalein causes its rapid excretion, the conclusion might be drawn that the sulphonic acid group is essential for rapid elimination; but

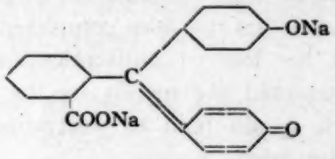


FIG. 3. Phenolphthalein (sodium salt).

this theory is upset by the action of the following group of compounds. The sodium salt of sulphonated phenolphthalein has no antiseptic value.

Conclusion.—The phthaleins give no promise of value as urinary antiseptics.

XANTHONES.

Compounds of this class are characterized by the fact that the two phenol groups are linked together by an oxygen atom, as illustrated by the structural formula given in Fig. 4. It will be seen that this formula differs from that of phenolphthalein only in the presence of an oxygen atom, although the two compounds possess divergent biologic properties. The compounds of this class investigated were fluorescein (resorcinphthalein), sulphonefluorescein (resorcinsulphonephthalein), orcinsulphonephthalein, rhodamin and resorcinsaccharein. All of these compounds in solution are greenish and extremely fluorescent, and without exception they are excreted by the kidney with a rapidity as great as that of phenolsulphonephthalein, if not greater; the average rate of excretion for the group being 70 per cent. in one hour. Since these compounds are quite different chemically, but have one characteristic in common (the oxygen linking two phenol groups), and since they all show great "renal affinity," it is reasonable to assume that we have here a definite relationship between chemical structure and physiologic action.

This class further shows that the sulphonic acid group is not essential for rapid excretion.

As germicidal agents, all four are inert excepting rhodamin, which comes very close to filling all the requirements. Rhodamin, which differs from fluorescein in that the two hydroxyl groups are replaced by amino groups, is chemically stable and nontoxic, is rapidly excreted, and kills the colon bacillus in one hour in a dilution of 1 : 2,000, in water; but when the compound is diluted in urine, this property is entirely lost. An investigation of the nature of this interfering action in urine has not been completed, but present experiments indicate that the loss of antiseptic power of rhodamin in urine cannot be accounted for merely by the buffer value of the urinary salts, which would tend to neutralize any acid or basic properties that a drug might possess.

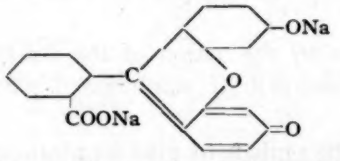


FIG. 4. Fluorescein (sodium salt).

COMMENT.

It is hoped that these experiments may call attention to the inadequacy of the urinary antiseptics in general use, and stimulate interest in the possibilities offered by synthetic chemistry. These investigations are at present being continued, and the properties of various related compounds studied, some of which are old and well known, and others of which are new compounds, synthesized so as to contain various chemical groups that have been shown to produce desired biologic properties.[11]

[11] In addition to the references already given, the following will be found of interest:

Clark, W. M., and Lubs, H. A., "The Colorimetric Determination of Hydrogen Ion Concentration and Its Applications in Bacteriology," *Jour. Bacteriol.*, 1917, 2, 1.

White, E. C., and Acree, S. F., "On the Quinone-Phenolate Theory of Indicators: The Electrical Conductivity of Solutions of Phenolsulphonephthalein and of Its Bromo and Nitro Derivatives," *Jour. Am. Chem. Soc.*, 1917, 39, 648.

White, E. C., "On the Quinone-Phenolate Theory of Indicators: The Reactions of Phenolsulphonephthalein and of Some of Its Derivatives," Thesis, Univ. Wisconsin, 1915.

Conclusions.

The property possessed by phenolsulphonephthalein, by virtue of which it is rapidly eliminated by the kidney, is by no means limited to this compound. Several other more or less closely related compounds show the same striking "renal affinity," and might also be of value in testing renal function were it not that phenolsulphonephthalein itself is so nearly ideal for this purpose.

Compounds of the xanthone class, that is, phthaleins (though not necessarily sulphonephthaleins) in which there is an oxygen atom linking the two phenol groups, show a similar remarkable "renal affinity."

The bromination of these compounds, both sulphonephthaleins and xanthones, interferes with their excretion.

In view of the hitherto overlooked fact that numerous actively germicidal compounds lose their strength (owing to an as yet unexplained cause) when simply diluted with urine in a test tube, the value of every drug used for the purpose of urinary antisepsis ought to be questioned until its antiseptic strength *in urine* has been experimentally demonstrated.

Since it has been possible to establish a certain relationship between chemical structure and renal excretion, and to predict, with a reasonable amount of accuracy, which drugs will and which will not be rapidly excreted; since the synthesis of germicidal compounds, very closely related to the types excreted, has been accomplished; and since one of these germicidal compounds (rhodamin) was excreted and would have been successful but for the interfering action of the urine, the problem has been shown to be worthy of further investigation.

NOTE ON EUONYMUS ATROPURPUREUS.[1]

By E. M. Holmes, F.L.S.

The root bark of *Euonymus atropurpureus*, although discarded for the U. S. P., is still retained in the B. P. Having recently had occasion to compare a specimen of the bark, which had been rejected as not genuine, with the description in the B. P., I found the description given in that work quite inadequate for recognition of the

[1] Reprinted from the *Pharmaceutical Journal and Pharmacist*, February 23, 1918.

genuine bark by the eye or even with the aid of a lens. As in the case of Cusparia and other barks with a soft, friable, or spongy cork, the external surface is apt to vary greatly in appearance. On referring to Maisch's "Materia Medica" I found the following description, which is certainly better than that of the B. P.: "Description: Quilled or curved pieces about 2 Mm. (1/12 in.) thick; outer surface ash gray with blackish ridges or patches, detached in thin and small scales; inner surface whitish, or slightly tawny; fracture smooth, whitish, the *inner layers tangentially striate;* nearly inodorous; taste sweetish, somewhat bitter and acrid." Stille and Maisch, in the United States Dispensatory, state that the bark is "mottled with larger or smaller patches" or *fine longitudinal* scaly *ridges* and meshes with brown or blackish cork, detaching in very thin and small scales." The bark that arrives in this country is usually almost free of the blackish detachable minute scales, probably due to friction in the packing and the sea voyage, especially as the bark attracts moisture in a damp atmosphere.

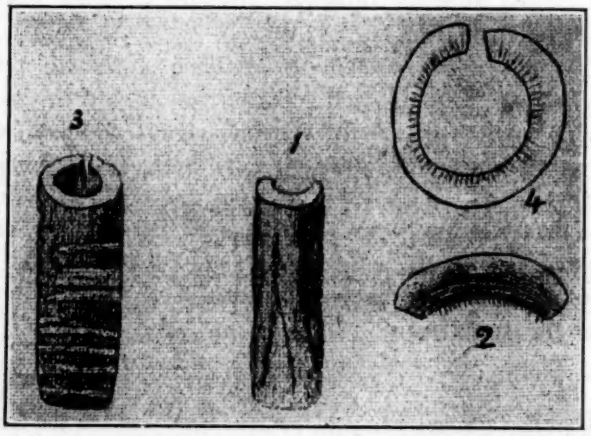


FIG. 1. *Euonymus atropurpureus,* showing longitudinally striated outer surface. FIG. 2. Showing tangential stratification of the liber. FIG. 3 False bark, showing tranverse scars on outer surfaces. FIG. 4. Showing absence of stratification in the liber.

The fine longitudinal ridges are also mentioned by Planchon and Collin's "Drogues-Simples," tome II, p. 594, but no mention is made of the blackish detachable scales, which are not usually present in European samples. A good idea of these longitudinal striations

is given in "Pharmacopedia," the illustration having been drawn, under my superintendence, from genuine specimens in the museum of the Pharmaceutical Society by Mr. J. N. Fitch, pl. XVII, Fig. 2a.

Greenish, in "Materia Medica," p. 217, points out a characteristic feature of the bark (visible only under a powerful magnifier, such as a platyscopic or triplet lens), viz., that if the bark is broken transversely and the pieces separated very gently from one another, delicate mucilaginous threads will be seen connecting them, and consisting of the "mucilaginous" contents of certain cells of the bark. (In my opinion these contents are probably more of the nature of caoutchouc.) The character is, however, a useful one. This statement has been copied almost word for word by the author of "Pharmacopedia," p. 166, published two years later.

The specimen of bark sent to me as regarded with suspicion, and rejected as not genuine, consisted of about one part in eight of bark longitudinally striated externally, the transverse fracture showing tangentially striated liber, and at its inner edge the silky threads described by Greenish, and was, therefore, undoubtedly *Euonymus atropurpureus.* The other seven parts consisted of a bark almost identical in color and general appearance, but on the average somewhat thicker and *distinctly marked with numerous transverse scars;* the transverse fracture did not show any tangential striation of the liber, nor were the delicate threads visible in the fractured bark. The microscopical structure showed a distinct difference in the two barks. In euonymus the medullary rays are numerous, very narrow, and consist of a single row of cells, as shown by Planchon and Collin, *i. e.,* Fig. 4 (distinguishable by the cells being *radially* elongated, whilst those of the surrounding cells are slightly elongated *tangentially*).

In the false bark the medullary rays consist of about three rows of cells, and all more distant than in euonymus, and there are numerous oval cells five or six times as large as those of the ordinary parenclyma, containing a yellowish secretion. By the character of the medullary rays alone, the two barks are easily distinguished under the microscope.

I have not as yet been able to identify this bark externally; it presents some resemblance to that of *Ptelea trifoliata,* but the medullary rays in that bark, consisting of three or four rows of cells, are *filled with a series of sphæraphides,* which do not occur in the medullary rays of the false euonymus. The only other common

species of euonymus, *E. Americanus,* has orange-red roots, and, therefore, could not possibly yield it.

The only suggestion that I can offer at present is that it may be derived from some Araliaceous or Rutaceous plant.

For some years past I have noticed that the euonymus of commerce varies in its activity, even when obtained from the same manufacturer, and the unrecognized occurrence of the false euonymus may possibly account for this difference. It has probably been in commerce for some years, as Greenish ("Materia Medica, 1899," p. 217) mentions that *the bark has occasional small transverse scars,* a statement which is copied by the author of "Pharmacopedia," p. 166. In any case, it will be advisable for pharmacists to give preference to *Euonymus atropurpureus* bark, which shows externally a longitudinally striated cork and a tangentially striatified liber (best seen under a good lens after wetting the transverse section with the finger), and delicate threads when gently broken transversely, and that shows the medullary rays, consisting of a single row of cells.

THE PREPARATION OF *N*/100 PERMANGANATE SOLUTIONS.

By J. O. Halverson and Olaf Bergeim.

The preparation, standardization and conditions of use in volumetric analysis of *N* and *N*/10 solutions of potassium permanganate have been studied with some care.[1] Unfortunately, however, certain of the precautions which have thus been shown to be necessary for accurate work have been commonly neglected in the literature, even in handbooks of general and applied analytical chemistry. As a result of this and of the widening application of permanganate titration methods, especially in biochemistry, certain methods based on this principle have been recently suggested which possess unnecessary inaccuracies. Common errors are the use of too much sulphuric acid in titrations and a lack of appreciation of the great sensitivity of permanganate solutions to traces of organic matter. In the determination of very small amounts of substance, as, for

[1] See Gooch's "Methods in Chemical Analysis," 1st Ed., New York. Reprinted from *The Journal of Industrial and Engineering Chemistry,* February, 1918.

example, in the estimation of calcium as oxalate in small portions of biological fluids[2] where permanganate solutions approximately $N/100$ must be used, the elimination of these sources of error is a necessity.

Where a standard permanganate weaker than $N/10$ was desired it has been customary to make this shortly before using by dilution of a stronger permanganate solution,[3] in spite of the fact that ordinary distilled water contains appreciable amounts of organic matter which can be removed only with great difficulty. For instance, we have found that water redistilled from both acid and alkaline permanganate may still cause an appreciable deterioration (as much as 2 or 3 per cent.) when used in diluting permanganate from $N/10$ to $N/100$. This was true even where the weak solution was used at once. If allowed to stand for any length of time, or if less carefully distilled water was used, the permanganate was almost entirely decomposed, this process being hastened by the catalytic action of the oxides of manganese which were formed.

To avoid the inconvenience as well as inaccuracy of dilution we have endeavored to prepare permanent $N/100$ solutions. The principle used is not new, but the technique as we have adapted it and some data pertaining to the keeping qualities of dilute permanganates and of oxalic acid solutions used as standards may be of interest.

Preparation of $N/100$ Potassium Permanganate.

Dissolve 0.04 Gm. pure potassium permanganate crystals in one liter of redistilled water in a thoroughly clean Florence flask which has been rinsed with the same water. Digest at or near the boiling point for 36 hours. A funnel covered with a watch-glass may be used as a reflux condenser. Cool and allow to stand over night. Without disturbing the sediment of manganese oxides, filter with gentle suction through a 3-in. Büchner funnel lined with ignited asbestos. Both funnel and filter flask should be rinsed with redistilled water. Transfer the permanganate solution to a glass-stoppered bottle free from traces of organic matter. The solution should be kept in the dark when not in use. If the asbestos be-

[2] Halverson and Bergeim, *J. Biol. Chem.*, 24 (1916), 22; 29 (1917), 337; Halverson, Mohler and Bergeim, *J. Am. Med. Assn.*, 68 (1917), 1309.

[3] See Michaelis, *Biochem. Z.*, 59 (1914), 166, and Ellinger, *Z. physiol. Chem.*, 38 (1903), 192, for example.

TABLE I.

Permanency of Permanganate Solutions, Etc.

No.	Solution.	Age of Solution.	Cc. Permanganate Required for Definite Volume Oxalic Acid.
1.	*N*/100 potassium permanganate	10 days	20.14
		25 days	20.20
		148 days	20.62
		185 days	20.65
		386 days	21.05
2.	*N*/75 potassium permanganate	2 days	11.88
		5 days	12.04
		15 days	12.15
2.	Separate bottle	2 days	11.81
		223 days	11.99
3.	*N*/50 potassium permanganate	1 day	8.14
		6 days	8.17
		19 days	8.25
		47 days	8.31
		68 days	8.45
		125 days	8.50
		180 days	8.55
4.	*N*/80 potassium permanganate (by direct dilution of *N*/10)	Theoretical	13.70
		15 minutes	14.20
5.	*N*/100 potassium permanganate (by direct dilution of *N*/10)	Theoretical	17.50
		15 minutes	17.83
6.	Same as Sol. 5	Theoretical	17.50
		15 minutes	17.81
7.	Same as Sol. 5	Theoretical	17.43
		15 minutes	17.69
		1 day	17.77
		2 days	18.18
8.	Oxalic acid 0.1101 Gm./100 C.C. (0.0175 normal)	1 hour	20.62
		18 days	20.58
		22 days	20.47
		72 days	18.06
9.	Oxalic acid, 0.1101 Gm./100 CC.	1 hour	20.54
		11 days	20.62
		14 days	20.62
10.	Oxalic acid, 0.1101 Gm./100 CC.	1 hour	8.34
		6 days	8.32
		10 days	8.30
		14 days	8.23
		19 days	8.27

comes clogged with oxides these may be dissolved out with hot concentrated hydrochloric acid, followed by washing with redistilled water without disturbance of the pad.

After standing two or three days this permanganate solution may be conveniently standardized against $N/50$ oxalic acid (0.1261 Gm. pure crystals to 100 Cc.) or sodium oxalate of similar strength. To 10 Cc. of the oxalic acid solution add 10 Cc. of 10 per cent. sulphuric acid which has been treated with just sufficient permanganate solution to give it a faint pink color. Place in a water bath at 65° C. for a few minutes. Then titrate at once to a definite pink color which persists for at least a minute. Correct for the blank obtained by titrating 10 Cc. of the sulphuric acid and the same volume of water to the same end-point.

If kept in a dark place, the oxalic acid solution used in standardization does not lose appreciably in strength in from ten days to two weeks. Ordinarily the permanganate solutions after they have stood several days will not vary over 0.1 per cent. per week (see Table I). On account of the sensitivity of the reagent it is, nevertheless, desirable to check it up rather frequently. This also serves as a control on technique.

The solutions on which the above data were obtained were kept away from the light except while in use. Solutions 1 and 3 were used almost every day. They were kept at room temperature throughout one summer and in the case of Solution 1 two summers. In the dilution tests redistilled water was used.

Conclusions

The preparation of weak permanganate solutions by direct dilution is inaccurate and inconvenient. By means of the procedure outlined in this paper $N/100$ potassium permanganate solutions may be prepared which will retain their strength and usefulness for an indefinite period.

THE GROUND-GLASS OBSESSION.[1]

Rumors continue to appear to the effect that ground glass has been found in food and that an investigation is to be made by the federal government. During the last two or three years we have passed through a whole series of such nation-wide "scares." Our readers may remember the vogue of infected court-plaster, of the insertion of various organisms into bandages and dressings, of the finding of numerous alleged bombs in different localities. Today ground glass holds the stage. Just why any intelligent spy, or even an unintelligent German diplomat, should choose ground glass to kill off a community is problematical. Neither has any one explained how enemy sympathizers are going to avoid the alleged manipulated foodstuffs. In works on forensic medicine and toxicology ground glass is mentioned as a mechanical poison.

When the glass is coarsely ground it produces mechanical lesions of the lining of the gastro-intestinal canal which become infected. Ultimately the condition resembles a catarrhal and hemorrhagic inflammation. Both may result from perforation of the stomach or bowel, or from infection of the wounds and extension of the inflammation. A meal of very finely ground glass is regarded by some as harmless, and it has been reported that it is even used as a remedy among the peasants of eastern Europe. The concealing of ground glass in flour or in sugar, the two substances most commonly mentioned in the newspapers—any amateur psychologist can figure out why—would necessitate that it be ground very fine. These stories may have a certain value in keeping the public alive to the dangers of the spy peril. On the other hand, they stimulate cranks and other unbalanced persons to "go and do likewise," thus lending a substantial basis to the original imaginative stories.

[1] From *The Journal of the American Medical Association*, March 23, 1918.

HOW TO MAKE B. I. P. P.[1]

Reference has been made in the *C. & D.* and *The Chemist and Druggist Diary,* 1918, to the composition and uses of B. I. P. P., devised by Professor Morison for treating infected war-wounds.[2] The inventor[3] now gives the details of the preparation, sterilization, and keeping of B. I. P. P. as worked out by Mr. Sidney Dunstan, chemist and dispenser to the Royal Victoria Infirmary, Newcastle-on-Tyne. The method adopted is as follows:

Iodoform	440 grams
Bismuth subnitrate	220 grams
Paraffin	220 grams
M. S. A.	

The bismuth and paraffin are sterilized by dry heat at a temperature of 120° C. for half an hour, and the bismuth after cooling is mixed with the iodoform in a mortar which has been sterilized by means of boiling water and formalin. The paraffin is added to the mixture at a temperature of 90° C. and thoroughly mixed, then put into specially made collapsible tubes with nozzle ends, holding 40 to 80 grams.

The paraffin used should be semi-solid, odorless, and tasteless, melting point 45° C., free from acidity and carbonizable organic impurities. The iodoform should be free from moisture, acids, and fixed impurities. It is also necessary that the bismuth be chemically pure, free from arsenic, and care taken in sterilizing that the temperature does not rise too high, otherwise nitrous fumes will be evolved. Should a paste be required of a softer consistency, the formula may be modified as follows:

Iodoform	440 grams
Bismuth subnitrate	220 grams
Paraffin base	220 grams
M. S. A.	

The paraffin base consists of

Paraffin, melting-point 45° C.	19 parts
Paraffin liq., sp. gr. 880	40 parts

[1] From *The Chemist and Druggist,* February 23, 1918.
[2] American Journal of Pharmacy, March, 1918, p. 199.
[3] *British Medical Journal,* II., 1917, p. 503.

THE NEW REMEDIES OF 1917.[1]

By Thos. Stephenson, Ph.C., F.R.S.Edin., Editor of "The Prescriber."

Antiseptics.—The conditions of the past year make it natural that pharmaceutical advances should have taken place mainly along lines of military necessity, and, as a result, new antiseptics take a prominent place in the records of the year's progress.

For general use in the treatment of wounds, while numerous newer compounds have been advanced, the hypochlorous acid antiseptics still hold their ground. Eusol is still employed, but Dakin's solution, being less acid and more scientific in its formula, has perhaps a greater vogue in military surgery, especially now that the "Carrel method" is so largely in use. The original formula for Dakin's solution was given in *The Chemist's Annual*. The necessity for having a proper percentage (0.45 to 0.50) of hypochlorous acid, and the absence of caustic alkali being imperative, a more scientific method of preparation has been adopted. According to Carrel (*Jour. Amer. Med. Assoc.*, 1916, **67**, 1777), the chlorinated lime must be accurately titrated with decinormal sodium thiosulphate. The percentage of active chlorine having been ascertained, the proportions of ingredients are determined by reference to a table, thus:

20 per cent. Cl. requires 230 Gm. chlor. lime; 115 Gm. Na_2CO_3; 96 Gm. $NaHCO_3$
23 per cent. Cl. requires 200 Gm. chlor. lime; 100 Gm. Na_2CO_3; 84 Gm. $NaHCO_3$
25 per cent. Cl. requires 184 Gm. chlor. lime; 92 Gm. Na_2CO_3; 76 Gm. $NaHCO_3$
30 per cent. Cl. requires 154 Gm. chlor. lime; 77 Gm. Na_2CO_3; 64 Gm. $NaHCO_3$

and so on, exact figures being given in the table for every percentage between 20 and 37. Anhydrous sodium carbonate is to be used; if the crystalline salt is employed 80 Gm. of dry salt must be replaced by 220 Gm. of crystalline salt.

To prepare the solution, the quantities are accurately weighed, and the chlorinated lime placed in a 12-liter jar with 5 liters of ordinary water, agitated for a few minutes, and allowed to stand overnight. At the same time the sodium salts are dissolved separately in another 5 liters of water. The sodium solution is to be poured all at once into the jar containing the maceration of chlorinated lime, the whole well shaken, and left to allow the calcium carbonate to

[1] Reprinted from the *Pharmaceutical Journal and Pharmacist*, February 23, 1918.

settle as it forms. After half an hour the supernatant liquid is siphoned off and filtered through paper.

Verification of strength should be made from time to time by means of decinormal sodium thiosulphate; 10 Cc. of the solution should require from 12 to 13 Cc. of the thiosulphate, equivalent to 0.45 to 0.50 per cent. of sodium hypochlorite. A simple method for the preparation of *eusol* is described. Stock solutions of liquor calcis chlorinatæ, B. P., and boric acid (4 per cent.) are used, 135 Cc. of the former being diluted to 750 Cc., and 250 Cc. of the boric acid solution added. This gives a liter of solution of the desired strength; should it be required for intravenous injection, 8.5 Gm. of sodium chloride dissolved in 250 Cc. of water is added in place of portion of the water used to dilute the chlorinated solution.

A solution of hypochlorous acid suitable for wound treatment may be produced by the passage of electricity through normal saline. If sea water be substituted for normal saline, a powerful disinfectant is produced, and this process has been adopted on board hospital ships with much success.

The "Carrel method" of employing hypochlorous antiseptic solution has been so widely used, and is so frequently referred to, that a word or two regarding it may be given here. This method consists essentially of three operations: (1) thorough opening up and cleansing of the wound; (2) continued irrigation, by suitable apparatus, with Dakin's solution or chloramine-T solution; (3) regular bacteriological control by examination of smears from the wound. The irrigation is given through fenestrated rubber tubes, resembling drainage tubes, and closed at one end; these are connected with a branched glass tube, which in turn is connected with a glass reservoir containing the antiseptic. The bacteriological examination is made every second day, the results being entered on a suitable chart, and when organisms are absent from the wound on three successive days, the wound is regarded as sterile. There seems little doubt that the Carrel method has come to stay—for the duration of the war at least.

A development of Chloramine-T or sodium para-toluene sulphochloramide has been effected in *Dichloramine-T,* which is toluene parasulphodichloramine. Chloramine-T being insoluble in liquid paraffin, it was impossible to use it as a nasal spray in this medium. Dichloramine-T, however, is soluble in eucalyptol, and this solution can be diluted with liquid paraffin so as to make a nasal spray. As

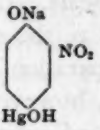
both eucalyptol and liquid paraffin have an affinity for chlorine, with consequent decomposition of the dichloramine-T, the oils must previously be chlorinated by treatment with potassium chlorate and hydrochloric acid. The nasal spray is prepared by dissolving dichloramine-T, 0.2 Gm., in chlorinated eucalyptol, 2 Cc., adding liquid paraffin, 8 Cc., and mixing. As soon as a precipitate shows itself the solution should be discarded. A stock solution containing 10 per cent. in eucalyptol may be made, and this diluted with liquid paraffin, 1:4, as required. This stock solution will keep for a month. Oily solution of dichloramine-T has also been used as a spray and as a dressing for wounds.

A better solvent for dichloramine-T has just been announced by Dakin and Dunham (*B.M.J.*, Jan. 12, 1918). Ordinary hard paraffin is melted in a flask, and chlorine gas passed through it, at suitable temperature, to saturation. The product is an oily substance, which, when treated with sodium carbonate and filtered, gives a clear yellow oil slightly heavier than water. This oil, which the authors propose to call *Chlorcosane,* will dissolve 10 per cent. of dichloramine-T, the solution being practically stable if kept in amber bottles.

The use of aniline dyes as antiseptics has made some progress. *Brilliant Green* (see *The Chemist's Annual,* 1917, p. 46) has been further investigated, while a new, or rather, a resuscitated, compound, *Flavine,* or diamino-methyl acridinium chloride, has come into prominence. Flavine has since been known as *Acriflavine,* and another and similar acridine compound, *Proflavine* (diamino-acridine sulphate), which is cheaper to prepare, has also been introduced. More recent researches have cast some doubt on the real value of these compounds as antiseptics, it being held in some quarters that the methods of the early investigators were faulty and their deductions unreliable; whether or not these contentions will be upheld remains to be seen.

A new mercurial germicide has been introduced by *Schamberg* (*Jour. Amer. Med. Assoc.*, 1917, 68, 1458) under the name of *Mercurophen.* This is sodium oxymercury-orthonitrophenolate; it contains 53 per cent. of Hg, and its formula is as shown below. It is an odorless brick-red powder, freely soluble in water, giving a yellow solution. It is said to be thirty times as powerful as mercuric chloride, with only about one fifth its precipitating power on serum proteins. Solutions of 1:5,000 have no tarnishing effect on instru-

ments, and its toxicity is much lower than that of mercuric chloride.



Acetozone, which is a mixture of benzoyl-acetyl peroxide with an inert powder, is not new, but its use has been confined to that of an intestinal antiseptic. It has now been found to be of service in military surgery as a dressing for wounds. It is non-toxic and innocuous to the tissues; its solutions are colorless and do not stain, and its action is rapid.

Among other antiseptics that have received favorable comment are *Bacterol,* a formaldehyde-iodine compound, and *Yadil,* described as a trimethenal allylic compound. The former is issued in several forms, according to the use for which it is intended, while the latter claims to be absolutely non-toxic—so much so that it can be given internally in teaspoonful doses.

An important pronouncement regarding antiseptics was made early in the year by Kenneth Taylor, who declares that just as each disease requires its own specific drug, so each organism can be controlled only by its own specific antiseptic. This specificity of antiseptics opens up an immense field for research, and if confirmed will do away once for all with the idea of a general antiseptic for all purposes. It will also account for the varying reports received from different quarters regarding certain antiseptic substances.

Bismuth-iodoform-paraffin paste, or "*Bipp,*" has now many advocates. Its use in wound treatment has spread considerably during the year. The paste consists of bismuth subnitrate, 1; iodoform, 2; liquid paraffin, q.s., and it is applied freely to the wound, which is entirely filled with the paste and dressed with sterile gauze. In preparing "Bipp" great care must be taken to ensure freedom from grit.

Paraffin Treatment of Burns.—The use of a French proprietary called *Ambrine* was announced comparatively early in the war. Ambrine is a preparation of hard paraffin, containing, some say, resin and oil of amber. When melted and applied to burns or wounds, it forms an air-tight coating under which the lesion rapidly and completely heals. Its success was undoubted, and it was not long before investigations were afoot with a view to ascertain the *rationale* of its

action, and, if possible, to discover an effective and inexpensive substitute for use on a large scale. Ordinary paraffin was not sufficiently plastic when applied to the skin, and attempts to mix resin with it failed, owing to separation of the resin when the mixture was heated. It was found, however, that when hard paraffin was heated to 130° C. by means of super-heated steam, some molecular change took place, the melting point was reduced several degrees, and the substance took on properties similar to ambrine. This paraffin, with the addition of certain antiseptics, is known officially as "No. 7 Paraffin," and its formula is: Resorcin, 1 (or beta-naphthol, 0.25); oil of eucalyptus, 2; olive oil, 5; hard paraffin, 67; soft paraffin, 25. The method of application is as follows: The burn is washed with sterile water, and carefully dried; a layer of melted paraffin is then painted on, and covered with a thin layer of cotton wool; a second layer of melted paraffin is applied over that, and the whole covered with wool and a bandage. The dressing is changed daily at first, later every second day.

It was not long before a number of ambrine substitutes appeared on the market: *Ambryl, Cerambine, Parakao, Parresine,* etc., are examples of these. A mass of literature has appeared regarding this treatment, and the result of further investigaiton to date has brought out several facts. First, pure hard paraffin, of suitable melting point, is superior to any mixture, the addition of wax or resin being unnecessary. Second, the pain caused by the first application may be obviated by substitution of liquid paraffin for melted paraffin for the first coat. Third, if antiseptics or anæsthetics are to be added, these should be incorporated with the liquid paraffin used for the first application, and not with the hard paraffin. The paraffin method has been an undoubted success; it is clean, simple, inexpensive, and efficient, and, if liquid paraffin be used as the preliminary application, practically painless.

Dealing with the use of antiseptics in connection with the paraffin treatment, Hull (*B.M.J.*, Dec. 15) finds that the best method is to paint the burn with a solution of an antiseptic before applying the paraffin. The best antiseptic is, he finds, acriflavine, a solution of 1:1,000 being used. He also gives the following formulæ:

No. 7 Paraffin.—β-naphthol, 0.25; eucalyptus oil, 2.0; olive oil, 5.0; soft paraffin, 25.0; hard paraffin, 67.75.

No. 10 Paraffin.—Scarlet red, 0.2; eucalyptus oil, 2.0; olive oil, 5.0; hydrous wool-fat, 4.0; soft paraffin, 21.0; hard paraffin, 67.8.

No. 11 Paraffin.—As No. 10, at the expense of the soft paraffin.

No. 12 Paraffin.—As No. 7, but with brilliant green, 0.05 per cent.

No. 13 Paraffin.—As No. 7, but with flavine, 0.2 per cent.

No. 14 Paraffin.—As No. 7, but with dichloramine-T, 0.2 per cent.

In the *Jour. Amer. Med. Assoc.*, 1917, 69, 1525, appears a description of the paraffin required for film treatment known as "surgical paraffin," or "plastic paraffin." It is required to be more ductile and pliable than the official (U. S. P.) paraffin, and to be liquid at or below 50° C. A thin film, when prepared and tested as described below, should be pliable at or below 28° C. and ductile at or below 31° C. At body temperature it should be pliable, and adhere to, but permit ready detachment from the skin.

Test.—The pliability and ductility of paraffin are determined as follows: A little of the melted substance is poured on water having a temperature of about 40° C., so as to form a number of separate films. The temperature of the bath is then gradually lowered by the addition of cold water to determine the pliability and ductility. The film while immersed in water is doubled on itself and the temperature of the water observed at which the film breaks sharply on *one* fold (pliability test). The film is stretched while under water, and the temperature of the water noted at which the film breaks sharply and evenly (ductility test). A small surface of the forearm is painted with melted paraffin, covered with a thin layer of cotton, another coat of paraffin painted on the cotton; and then dressed with cotton and bandage. After one hour the film should remain attached to the skin, showing it is adherent, but be easily removable.

(*To be continued*)

PHILADELPHIA COLLEGE OF PHARMACY.

Minutes of the Annual Meeting.

The annual meeting of the Philadelphia College of Pharmacy was held March 25, 1918, at 4 P.M. in the Library.

The President, Howard B. French, presiding.

The minutes of the quarterly meeting held December 31, 1917, and the special meeting held January 2, 1918, were read and approved.

The minutes of January 4, the memorial service for Professor Joseph P. Remington were not read, as they had been fully published in the AMERICAN JOURNAL OF PHARMACY, Volume 90, pages 79–107.

The minutes of the Board of Trustees for December, 1917, January and February, 1918, were read by the Registrar, J. S. Beetem, and approved.

President French then read his Annual Address. It was quite lengthy, giving in detail the activities of all the departments of the College. It was listened to attentively and hearty applause was given at its close. Mr. England moved that the address be referred to the Committee on Publication to abstract such portions for publication in the AMERICAN JOURNAL OF PHARMACY that would be of the greatest interest. So ordered. See this JOURNAL, pages 380–386.

Professor Lowe for the Committee on Pharmaceutical Meetings reported verbally that there had been no meetings held during the year. The meetings of the Philadelphia branch of the American Pharmaceutical Association had largely taken over the subjects formerly discussed. Nevertheless the Committee on Nominations deemed it best to continue the existence of the committee as conditions might arise in the future which would make it desirable to hold these meetings as formerly, and so had placed in nomination a list of names to be acted on at the annual election.

The Committee on Necrology reported the names of deceased members during the year. As obituary notices had been published previously the names are only reported at this time as a part of the proceedings of the annual meeting.

Fred F. Mueller died at Los Angeles, June 29, 1917.

Doctor Charles T. George died at Harrisburg, December 26, 1917.

Joseph P. Remington died at Philadelphia, January 1, 1918.

REPORT OF THE CURATOR, JOSEPH W. ENGLAND.—The museum is in good condition and has received a number of valuable accessions during the year. A number of specimens have been rearranged to better advantage. Professor Youngken states that he has undertaken the better classification of the college herbarium according to the widely recognized system of Engler and Prantl. Some suggestions are also made to greatly facilitate reference to the collection. It is also recommended that the cases in the museum be lettered and the contents be card-indexed, and an inventory be made of all the articles in the museum.

The report was discussed by Mr. Beringer and ordered referred to the Committee on Museum with power to act.

REPORT OF THE ACTING EDITOR OF THE AMERICAN JOURNAL OF PHARMACY.—The events of the past year have placed upon the acting editor the responsibility of making an annual report covering largely the work of others. As his service, in this capacity, began with October and had only to do with the last two monthly issues of the 89th volume, he fears that you may have to pardon the omission of much of the usual details of preceding reports of the editor. The withdrawal of the editor during the year, and the decease of such prominent members of the Committee on Publication as Dr. M. I. Wilbert and Professor Joseph P. Remington, have made gaps which it is difficult to fill.

The 89th volume of the AMERICAN JOURNAL OF PHARMACY was issued in the regular monthly numbers during the year 1917. It has maintained fully its position as the ethical pharmaceutical journal of America, in which is recorded the best work of pharmaceutical and allied investigators in a permanent form for study and reference. The number of pages printed in this volume has been somewhat in excess of that in recent years and may be exceeded even more in the present year.

More than seventy original papers have been published during the year, covering a very wide range of topics. This number is exclusive of book reviews, obituary notices, trade interest notes, etc., which have been continued throughout the monthly numbers as usual. In addition many articles have been reprinted or abstracted from other publications. The meetings of the College and of various pharmaceutical and drug trade organizations have likewise been reported in its pages. The value of the original papers that have been published in the JOURNAL is shown by the frequency with which they are republished and referred to in our contemporaries.

The papers and many of the reprinted articles exhibit the spirit of the time and the existing conditions under which not only the policies, history and boundaries of many nations are being revolutionized, but likewise the scientific methods and professional practices are being recast. This gigantic war has introduced numerous new problems in medicine, surgery and pharmacy and the space available in the JOURNAL is being taxed to properly present these to our readers. The importance of these demand the fullest detailed statements possible and the widest circulation of the information so that

pharmacists may be prepared to creditably meet their share of the nation's great responsibilities.

The JOURNAL naturally reflects the viewpoint of the editor as to the needs of the time and of the interests the JOURNAL serves and in the selection of material for publication his personal judgment may at times be at fault. Several innovations have already been introduced, such as the monthly editorial column and the extended abstracts from current literature. These appeared to be in the line of duty and from the editor's viewpoint desirable, but he has been endeavoring to gauge the opinion of the readers of the JOURNAL as to the acceptability of these and the possibility of introducing other innovations that are considered as features of modern journalism, without in the least affecting the scientific standing of the publication.

The business manager is giving good service to the advertising clientele and his efforts are being devoted to improve the pages that are assigned to trade offerings and the wants of druggists and manufacturers and doubtless this will prove beneficial to the advertisers as well as to the JOURNAL. The introduction of "Classified Advertisements" opens up an avenue that should appeal alike to employers and employees and which should be well patronized as valuable to both.

The coöperation established between the editorial and business management is beginning to show results in the increased number of subscribers and some additional advertisements and as the systematic work progresses, it is our hope that this will redound more effectively to the betterment of the JOURNAL, increase its value as an advertising medium for standard wares and above all extend its usefulness to the Philadelphia College of Pharmacy and to the advancement of pharmacy, the one common interest to which we all subscribe.

REPORT OF THE COMMITTEE ON PUBLICATION.—Read by Professor Samuel P. Sadtler.

This report is largely a statement of receipts and disbursements for the year, also a statement as to the number of subscribers, full paid and others. Students are privileged to secure the JOURNAL at the nominal price of $1.00 per year and a large number of the students are subscribers. The "Remington Memorial Number" of the JOURNAL was an unusually large edition, owing to the fact that it was mailed to each one of the alumni of the college. An appropriation was voted by the College for the use of the Publication Committee.

REPORT OF THE LIBRARIAN was presented by Miss Katharine E. Nagle. There have been 214 accessions this year, which brings the number of volumes belonging to the library up to 14,675. There are also several thousand pamphlets accessible. The use of the library for the year was by students 3,103 times, professors 163 times, public 103 times, a total of 3,369 persons.

REPORT OF THE COMMITTEE ON NOMINATIONS was read by the Secretary, when the President appointed Mitchell Bernstein, E. H. Hessler and Charles F. Liebert to conduct the election for officers, trustees and committees.

In this connection Mr. Beringer stated that he had not been consulted as to placing his name on the list of nominees for the position of editor. When he accepted the position of acting editor when Professor Kraemer resigned he considered it only a tentative arrangement, and he desired it to be known that he wished the College to be free to elect some one else as editor at any time. He realized there was too much demand on his time and services, and it was a serious question with him as to what to give up or retain to preserve his health. He would give to the position on the JOURNAL the best that he could, but would relinquish it at any time in favor of any one the College would select.

ELECTION.—Professor Stroup moved that in the election for trustees those receiving the highest votes should be for the three years term, the next highest vote for the two years term, and the next highest vote for the six months term. Agreed to.

REPORT OF THE COMMITTEE ON MEMBERSHIP.—While the tellers were counting the ballots this was read by Professor Stroup.

When, after the death of Professor Remington, it was decided to make the February number of the AMERICAN JOURNAL OF PHARMACY a "Remington Memorial Number" it occurred to Professor E. F. Cook that it would be a good idea to send a copy to each alumnus of the College, and, at the same time, make an appeal for him or her to become a member of the College. The idea met with the approval of the President of the College and other members of the Board of Trustees and we were authorized to go ahead. Accordingly there were mailed a few weeks ago to the alumni not already enrolled as members of the College a copy of the JOURNAL and literature bearing on securing prospective students' names, the code of ethics of the College and a personal appeal to join the College.

To date the results of the campaign have been as follows:

First, the receipt of a considerable number of names of prospective students.

Second, the receipt of several hundred cards containing more or less brief autobiographies of alumni.

Third, the receipt of data enabling us to correct the addresses of about a hundred of the alumni.

Last, and probably most important, the receipt of more than eighty applications for membership in the College, one for life membership, about two thirds for active membership, and the remainder for associate membership. These applications will be presented to the next meeting of the Board of Trustees, and can be acted on one month later.

Professor Moerk suggests that a list of the members of the College be posted in a readily accessible place in the library, or a card index list of names and addresses of members be prepared.

COMMITTEES AND DELEGATES APPOINTED.—The President made the following appointments:

To membership on the Combined Committee on Centenary and Historical Committee to fill vacancies by death and removal: Walter A. Rumsey, Joseph W. England and J. W. Sturmer.

Committee on By-Laws: George M. Beringer, Joseph W. England, C. A. Weidemann.

Delegates to the meeting of the Pennsylvania Pharmaceutical Association: Charles H. LaWall, F. P. Stroup, F. X. Moerk, E. F. Cook, J. W. Sturmer, O. W. Osterlund, John K. Thum.

Delegates to the meeting of the Delaware Pharmaceutical Association: Dr. A. W. Miller, Dr. C. B. Lowe, H. J. Watson, S. L. Foster.

Delegates to the meeting of the New Jersey Pharmaceutical Association: Dr. C. B. Lowe, George M. Beringer, Charles H. LaWall, J. W. Sturmer, H. W. Youngken.

Professor Stroup, on behalf of Mrs. Maisch, presented some colored lantern slides and cuts that had been used in published papers by Professor John M. Maisch, and on motion they were accepted and the thanks of the College voted to Mrs. Maisch.

Bill of J. E. Soule for engrossing the memorial resolutions to Professor Remington was presented and ordered paid.

The tellers having concluded their count reported the election of President, Howard B. French; First Vice-President, R. V. Mattison,

M.D.; Second Vice-President, Joseph L. Lemberger; Treasurer, Warren H. Poley; Corresponding Secretary, A. W. Miller, M.D.; Recording Secretary, C. A. Weidemann, M.D.; Curator Joseph W. England; Editor, George M. Beringer; Librarian, Katharine E. Nagle.

Trustees: R. M. Shoemaker, W. A. Rumsey, J. M. Baer, Ambrose Hunsberger, Otto Kraus.

Publication Committee: Samuel P. Sadtler, Joseph W. England, Charles H. Lawall, George M. Beringer, John K. Thum, J. W. Sturmer, R. P. Fischelis.

Committee on Pharmaceutical Meetings: C. B. Lowe, M.D., George M. Beringer, Charles H. Lawall, E. Fullerton Cook, John K. Thum.

Whereupon the President declared them duly elected.

Letters of condolence on the death of Professor Remington were read from the University of Havana, Cuba, Dr. Gabriel Casuso, Rector (President), The Liverpool Chemists' Association, David H. Evans, Honorary Secretary, and "The General Medical Council of the United Kingdom," Sir Donald MacAllister, President.

These letters were referred to the Editor of the JOURNAL.

After these letters had been read Mr. Beringer expressed regret that these communications and some others had not been received in time to be inserted in the memorial number of the AMERICAN JOURNAL OF PHARMACY or in the memorial pamphlet that had been prepared, and asked the opinion of the members as to the distribution of the pamphlet. His own view was they should be sent to the members of the College, the Committee on Revision of the Pharmacopeia, and friends of Professor Remington and of the College; after some discussion it was voted to distribute them as Mr. Beringer had suggested.

C. A. WEIDEMANN, M.D.,
Recording Secretary.

ABSTRACTS FROM THE MINUTES OF THE BOARD OF TRUSTEES.

December 4, 1917. Committee on library reported 9,269 books accessioned and 7,471 books catalogued. A number of gifts were received and a number of purchases made. 343 persons used the library during the month.

Committee on instruction reported that several meetings had been held to consider corrections and amendments to the Pharmaceutical

Syllabus. Also to consider the advisability of a special course (to be given as a postgraduate course after the College session) covering training suitable for pharmaceutical, sanitary and hygienic practice in the Army, and to ask the Board of Trustees for their approval.

The faculty generously tendered their services for the course, hoping by so doing to aid the government as well as the profession of pharmacy. On motion the action of the committee was approved.

Committee on scholarships. The chairman stated that the committee should be enlarged by associate membership, and asked that Professors Moerk, Sturmer and LaWall be added as associate members. It was so ordered.

Committee on examinations reported that Donald W. Huber, P.D., and Percy D. Neeld had completed the full course in technical chemistry and having passed their examinations were entitled to receive the certificate of proficiency in chemistry. On motion it was ordered that certificates be granted to them.

The committee also reported that Everett J. Roberts had completed a special course in the analysis of fuels, oils and water, covering one thousand laboratory hours and one hundred and twenty lectures and is, therefore, entitled to a special certificate. On motion a special certificate was granted.

By invitation, Prof. Sturmer appeared before the Board to give his views regarding the desirability of considering at the present time the names of a number of students who had completed their scholastic requirements last June and had since presented satisfactory evidence of completing four years practical work as being eligible for a degree of Ph.G. and not to hold them over until June, 1918. After some explanation and discussion, it was voted that these students be declared graduates and that they should receive their diplomas at the next commencement.

The Secretary of the Board announced that he had received letters of appreciation from the recipients of scholarships.

The committee on membership reported favorably on the application of Anton Hogstad, Jr., for associate membership. A ballot was taken and he was unanimously elected.

January 2, 1918. Fourteen members were present.

Mr. French moved that the usual course of business be suspended out of respect to the memory of our late Dean and that the meeting adjourn to meet Tuesday, January 8. It was so ordered.

On motion, it was ordered that the College be closed Friday,

January 4, except for the memorial services which were to be held at 3 o'clock in the afternoon.

Notices were ordered to be sent to the membership of the College and to the alumni stating that the funeral services of Professor Remington would be held at Holy Trinity Church, Friday, January 4, at 1 P.M. and that a memorial service would be held at the College at 3 P.M.

January 8, 1918. Committee on property reported some trouble with frozen pipes, which were being repaired.

Committee on library reported the use of the library during the month by 311 persons.

Committee on examinations presented the names of two persons for the honorary degree of Master in Pharmacy. According to the By-Laws these names were referred to a special committee to report at the next meeting.

The committee further reported on matters relating to marks necessary for graduation and other matters in connection with the examination that had been considered at a meeting recently held by the heads of the departments.

Mr. Cliffe referred to Mr. Beringer's accident and moved that the Secretary be directed to convey to him the sympathy of the members of the Board and express their good wishes for his early recovery.

Applications from four persons for active membership and one for associate membership were referred to the committee on membership.

The committee on membership reported favorably upon the application of Prof. Jose P. Alacan, of Havana, Cuba, and Edgar A. Sparks, Burlington, N. J. A ballot was taken and they were duly elected.

The Secretary read a communication from Mrs. Joseph P. Remington expressing appreciation of the flowers sent by the Board of Trustees.

February 5, 1918. The Chair announced that the usual order of business would be suspended in order to receive a communication from the faculty. Dr. S. P. Sadtler as chairman of the faculty presented the following report:

The members of the faculty met on February 2 and February 5; Dr. Sadtler presided at both meetings. It was unanimously decided that Professor Charles H. LaWall be elected as dean of the

faculty to fill the vacancy caused by the death of Professor P. Remington.

It was also unanimously decided that the offices of dean of the food and drug course, associate dean, and assistant dean be abolished, and that there be created the office of dean of post-graduate and special courses, which position should be filled by Professor Julius W. Sturmer, who with Professor Charles H. LaWall and Professor Frank X. Moerk, director of the technical chemistry department, shall constitute the executive officers of the faculty.

The report was received and the recommendations taken up seriatim:

First, that Professor Charles H. La Wall be elected as dean of the faculty. Approved.

Second, that the offices of dean of the foods and drug course, associate dean and assistant dean be abolished. Approved.

Third, that the office of dean of the post-graduate and special courses should be created and that Professor Julius W. Sturmer be made dean of same. Approved.

Fourth, that Professor Frank X. Moerk be made director of the technical chemistry department. Approved.

Fifth, that Professors LaWall, Sturmer and Moerk constitute the executive officers of the faculty and that they have the necessary clerical assistance. Approved.

The dean-elect Professor LaWall, Dr. Sturmer and Prof. Moerk were later invited to be present at the meeting.

Committee on library reported that 570 persons had used the library during the month.

A communication was received from Chairman Beringer, containing a number of recommendations and suggestions. After the reading of the communication, Mr. England moved that they be considered seriatim. It was so ordered.

First, to fill the chair of professor of theory and practice of pharmacy, Professor Sadtler nominated Professor Charles H. LaWall.

Second, to fill the chair of operative pharmacy and director of the pharmaceutical laboratory, Mr. Cliffe nominated Professor E. Fullerton Cook.

In accordance with the By-Laws, these nominations lay over until the meeting of the Board in March.

Third, that in the future the executive officers of the faculty be invited to attend the meetings of the Board of Trustees (except such

as may be deemed strictly executive) in order to advise with the Board, but without the privilege of voting. Approved.

The Chair congratulated Professor LaWall upon his election as dean of the faculty and Professor Sturmer as dean of the post-graduate and special courses, both of whom expressed their appreciation of the honor conferred upon them and their intention to further the interests of the College.

Fourth, the suggestion relative to the elimination of the degree of Doctor in Pharmacy (Phar.D.) for the three-year course and hereafter maintaining the degree of Doctor in Pharmacy for students who will carry on two years of higher study and research work after completing the course for the degree of B.Sc. in pharmacy was discussed. It was then moved that the degree of Doctor in Pharmacy (Phar.D.) be eliminated hereafter for a three-years course, with the understanding that students who had already matriculated for the course leading to this degree (Phar.D.) would be continued in this course for the degree as announced in the previous College Bulletin. It was so ordered.

Committee on examination reported that Maurice Blumberg and Maurice B. Dadney, who had passed their examinations for the degree of Ph.G. just previous to the last commencement, but who were deficient in practical experience, have submitted evidence as to the completion of that requirement and are now eligible for a diploma. On motion they were declared Graduates in Pharmacy.

The special committee to whom was referred the names proposed for the honorary degree of Master in Pharmacy reported through Dr. A. W. Miller, chairman, that they cordially and unanimously approved of the names that had been presented. Thereupon a ballot was taken and being clear the Chair declared Prof. E. Fullerton Cook, of Philadelphia, and Otto Raubenheimer, of Brooklyn, N. Y., elected to receive the degree of Master in Pharmacy (Ph.M.) Honoris Causa.

Mr. French read a communication from the Provident Life and Trust Company containing a copy of the eighth item in the will of the late Prof. Joseph P. Remington, covering a bequest to the College. Mr. French also read his reply acknowledging receipt of this information.

Communications were read from Mr. Benjamin T. Fairchilds, Professor Jose P. Alacan, the Cuban Branch of the American Pharmaceutical Association and Dr. Carl Alsberg, of the Department of

Agriculture, conveying personal expressions to the memory of Professor Remington.

A communication was read from the Secretary of the National Pharmaceutical Service Association asking for space in the library where, with the assistance of a stenographer, the work of the Association could be efficiently carried on. The request was granted in accordance with President French's reply to same.

Committee on membership reported favorably upon the application of Lawrence K. Boehme, of Germantown, O., Ralph R. Foran, Charles H. Fowler and Horace J. Hallowell, of Philadelphia, for active membership, and Dr. John H. Mills, Tampa, Fla., for associate membership. A ballot was taken and, being clear, they were duly declared elected to membership in the College.

ABSTRACTS FROM THE ANNUAL ADDRESS OF PRESIDENT HOWARD B. FRENCH.

Shortly after your last annual meeting, the United States was called upon to take aggressive action in the world's war in support of democracy and the freedom of the seven seas. To the credit of your honored institution it should be noted that 307 alumni and members of the college classes tendered their professional services to the United States government, through your President. After numerous interviews it was found that although a very large number of vacancies for pharmacists existed in the United States Army and Navy, it was necessary for those who wished to enter as pharmacists to enlist in a minor position, and with no prospect of advancement to commission rank.

Those actively interested in the College felt that the time had come to make an earnest effort to have a pharmaceutical corps established in the United States Army, and they have supported the National Pharmaceutical Service Association, which organization was formed for the specific purpose of improving pharmaceutical service in the departments of the government and obtaining proper recognition and rank for professional pharmacists in government service. A bill providing for a Pharmaceutical Corps in the United States Army was introduced in Congress by Hon. George W. Edmonds, one of your alumni. The bill, known as H. R. 5531, has received the endorsement of the College and a committee represented this College at the hearing held thereon in Washington by the Military Committee of the House. It is the hope of a large majority of the

medical and the pharmaceutical professions that this bill may be enacted so as to extend further care to the boys of our families who are fighting in support of the democratic freedom of the world. They deserve it and should have it and it is the hope of your President that all will use their earnest efforts with their representatives in Washington to have the Edmonds Bill enacted into a law at the earliest possible date. To-day we have a record of something under 200 of our alumni who are serving in defense of their country, and if proper recognition is given by the government to our profession, it is reasonable to suppose that hundreds more will tender their services to aid in alleviating the pain and distress of our soldiers at the front.

Through the liberality of the University of Pennsylvania and the concurrence of the city of Philadelphia, your College last summer was able to secure many thousand dollars worth of material and fixtures, formerly in the pharmaceutical department of the Medico-Chirurgical College, much of which has already been used in the microscopical, pharmaceutical and bacteriology laboratories and other parts of your buildings and the balance has been stored for future service.

Your entire plant is in fairly good condition and while it would be desirable to make some improvements, your committee on property feels that they would not be justified, at the present time, in making any improvements that could possibly be done without.

Last year seven courses of instruction were given and this year there are eight courses for which diplomas are given. Also a three years' course in analytical and industrial chemistry and a special course in bacteriology for which certificates are given.

Your Board of Trustees has recently eliminated the Phar.D. degree for three-year course except for those students who enrolled for the session 1917–1918 and in future this degree will be awarded only to those who continue their post-graduate study and the higher research work to be required for the doctorate degree.

Your Board of Trustees recently approved of several spring courses to cover the period from May 20 to June 29. The instruction is to be given by the present members of the faculty, who, with their usual coöperation and liberality, have consented to take charge without additional compensation. The courses will consist of clinical and sanitary analysis, microscopy of foods and drugs, laboratory

course in bacteriology, lectures and demonstrations in first aid and bandaging. The prime object of this instruction is to fit men for better service in the medical department of the Army and Navy.

Your President feels that you will be gratified to learn that the misunderstanding which has existed between the state of New York and your institution for some years has been adjusted to the satisfaction of both parties and he hopes that no further cause for misunderstandings will arise in the future.

The war and conditions incident to same has caused a material falling off in the attendance of students, although we are pleased to report that the decrease in attendance is a little less than the average of similar institutions and universities in the United States.

We have 369 students attending the College at the present time, 6 of these are taking the B.Sc. course (5 second-year and 1 first-year student) and 15 students from the first and second years are taking a course in bacteriology.

DEPARTMENT OF PHARMACY.—Prof. Charles H. LaWall has been elected professor in theory and practice of pharmacy and under his able management the department has shown marked progress. The work has been given along the same general lines as in former years; however, to keep the subject matter fully up to date caused a few minor changes to be made in the method of conducting the lectures and quizzes.

PHARMACEUTICAL LABORATORY.—Prof. E. Fullerton Cook has been elected professor of operative pharmacy and director of the pharmaceutical laboratory. The instruction in this department has been fully up to the standard during the past year.

In the post-graduate classes instruction has been introduced with the intention of qualifying these students as managers and "control men" in manufacturing laboratories, or as expert manufacturers in the retail stores. This work has covered the strictly pharmaceutical, with the necessary understanding of standardization by assay and also specialized manufacturing such as perfumes, cosmetics, dentifrices, etc. It also includes careful work in sterilization, disinfection, war antiseptics, and a thorough review of the latest and best methods in prescription dispensing.

Your professor of operative pharmacy has made a suggestion which seems to your president to be most desirable. He asks that the members of your Board of Trustees who are actively engaged in conducting retail drug stores hold a conference at least once a year

with the instructors of the pharmaceutical laboratory to go over the plan of instruction and to offer suggestions which in their opinion would increase the practical efficiency of the students.

CHEMICAL LABORATORY.—The chemical laboratory has as usual been most active during the present session. There have been 122 first-year students, 145 second-year students, 6 Phar.D. students, 8 Ph.C. students, 6 B.Sc. students (1 first-year and 5 second-year) and 26 special chemistry students, making a total of 313 students taking advantage of instruction in this department.

DEPARTMENT OF BOTANY AND PHARMACOGNOSY.—Since the last annual meeting, your former professor of botany and pharmacognosy tendered his resignation, which was accepted by your Board of Trustees, and his assistant, Heber W. Youngken, was placed in charge of the department and it is gratifying to report that his efforts in the department have been most satisfactory.

He has had a number of changes made in the laboratory, and his laboratory is now in splendid condition and most conveniently arranged for the instruction of the student body and it is particularly adapted for research, post-graduate and special students work.

The college herbarium is being rearranged and its numerous specimen sheets are being classified according to the Engler and Prantl System. This work is extremely slow, but with the earnest and active efforts of the professor, the herbarium will be placed in satisfactory condition.

The professor has collected a large variety of seeds of medicinal plants which he is germinating for use in the hothouse and roof garden. He also has secured a variety of medicinal plants from the botanical garden of the University of Pennsylvania and the Bureau of Plant Industry at Washington, which as soon as the weather will permit will be transferred to your roof garden.

Your President desires to again express the hope that the city or state will in the near future see the desirability of arranging for a botanical garden under the control of your College so as to assist the educational institutions in Philadelphia in the advanced study of botany and pharmacognosy.

DEPARTMENT OF BACTERIOLOGY.—Professor John A. Roddy, in charge of this department, was among the first to tender his services to the government, and was early sent to Fort Slocum and afterwards to Camp Dix, from which place he has been ordered to a western post. In all of these positions he has been most active and efficient.

During his absence the department has been placed in charge of Assistant Professor Louis Gershenfeld.

He has asked for increased facilities to accommodate the increasing number of students, and your committee on property has now under consideration the placing of additional tables in this laboratory, together with the fixtures and reagents requisite.

DEPARTMENT OF MATERIA MEDICA.—The professor in charge of this department reports satisfactory results in every way. His assistant, Dr. Mitchell Bernstein, who fills the vacancy caused by the resignation of Dr. Alfred Heineberg, due to the demands of his large medical practice, has shown himself well fitted for the position.

A physical examination of all students coming into the College was made at the beginning of the term. As a result of this, six applicants were found to be in a physical condition that did not justify their taking the College course and some of the others were instructed as to physical defects or needed reforms in their mode of life.

DEPARTMENT OF CHEMISTRY.—Professor Freeman P. Stroup, recently elected professor of general chemistry, makes an interesting and satisfactory report and he should be commended for his earnest efforts on behalf of the College.

The dean of the post-graduate course and special courses, Dr. J. W. Sturmer, has given close and active attention to his duties in the College and has aided greatly in looking after and caring for the students. Your President desires to commend him for his faithful and earnest efforts.

The financial condition of your College, while not as flourishing as we would like to report, shows that your Treasurer will have approximately $10,000 to our credit on April 1, 1918. The mortgages upon your property are the same as last year.

During the past year 6 members were elected to your College and 3 died, which makes the present active membership 147. Three associate members were elected during the year, which makes your associate membership at the present time 17.

It seems scarcely necessary for your President to make any extended comments regarding the loss which the College has sustained in the death of Prof. Remington. He had been intimately associated with the College for many years as professor and dean and had served on many of the most important committees and had also taken an active part in all the movements towards the advancement

of the institution. The memorial meeting held in this room on January 4, 1918, was a most notable occasion, and seldom, if ever, has it been the privilege of your President to have heard such eulogistic comments made regarding the results of a most useful life's work. He truly has left a name in the pharmaceutical and scientific world at large which places him in the list of those world-renowned pharmacists who have passed beyond—Proctor, Parrish and Maisch.

Professor Remington left a legacy to the College—not only a legacy of fame which he himself had built up, but a material legacy for which he provided in the eighth item of his will, which reads as follows:

> I give and bequeath unto The Provident Life and Trust Company of Philadelphia, and my son Joseph Percy Remington, their Heirs, Executors, Administrators, Successors and Assigns, Ten Thousand Dollars, In Trust, nevertheless, to invest, re-invest and keep the same invested, under the powers and authorities by this my Will upon my Trustees conferred, and to collect and receive the income, issues, dividends and profits thereof, and after paying out of said income all lawful costs, charges, taxes, commissions and expenses incident to the care and management of said Trust, then to pay over said net income, half-yearly, beginning with and disbursing the same from the time of my decease, unto the Treasurer for the time being of said Philadelphia College of Pharmacy, for application by said College in assistance of worthy and deserving students at said College, in payment of their tuition fees. Said College shall, in the exercise of its sole and unrestricted judgment, choose the students who may be worthy and deserving of such assistance, and said Trustees are hereby exonerated and released from any responsibility to see to the application of the income from said Trust after said Trustees shall have paid the same to the person who may be for the time being Treasurer of said Philadelphia College of Pharmacy. If said Philadelphia College of Pharmacy should cease to exist as an independent and separately conducted College for the instruction of students in the art and practice of Pharmacy, then and in such case said Trust for the use and benefit of said College shall cease and determine, and the money, investments and securities which may then comprise the capital or principal of said Trust, shall be distributed among the persons who would have been entitled to take and receive the same under the Intestate Laws of Pennsylvania if I had died possessed thereof at the time of the cessation of said Trust as aforesaid."

We have all lost an active associate and friend and it now becomes our duty to strive to live up to and maintain the standard which he had attained.

A further clause in his will provides that his apparatus, speci-

mens and illustrative material of every kind owned by him and used in connection with his course in theory and practice of pharmacy be bequeathed to Charles H. LaWall, and it is with pleasure that your President quotes in full a letter received from Professor LaWall on the 13th of March, 1918:

PHILADELPHIA, PA.,
March 12, 1918.

MR. HOWARD B. FRENCH,
York Avenue and Callowhill St.,
Philadelphia, Pa.

My dear Mr. French: As you doubtless know Professor Remington bequeathed to me all of the apparatus, specimens and illustrative material of every kind owned by him and used in connection with his course in the Theory and Practice of Pharmacy.

I feel sure that the proper ownership of all of this material should be vested in the College and I hereby transfer the entire collection, as received by me from Professor Remington, to the Philadelphia College of Pharmacy, through you as its principal officer.

This does not include Professor Remington's scientific library which was bequeathed to Professor Cook and me jointly and which we expect to place in the Pharmacy department of the College as a separate library for that Department.

When the time comes for me to lay down my duties, however, I shall take care to provide that my share of this library, too, shall go to the Philadelphia College of Pharmacy.

Very truly yours,
(Signed) CHARLES H. LAWALL,
Dean.

Again your President desires to call attention to the approaching centenary of your institution. Year after year is passing by and yet we have no site for new buildings but he still hopes that the city of Philadelphia or the Park Commission will be able to arrange to place your College upon the Parkway. He can but regret that up to the present no tangible result has been obtained by those who have worked to secure such a site.

Your President wishes to extend his appreciation and heartfelt thanks to all those who have so zealously coöperated with him during the past year in which many trials and difficulties had to be overcome, and he asks that the same loyal support, coöperation and activity will be extended to your executive during the coming year.

SOME ADDITIONAL RESOLUTIONS ON THE DECEASE OF PROFESSOR REMINGTON, RECEIVED SINCE THE PUBLICATION OF THE MEMORIAL NUMBER OF THE JOURNAL.

HAVANA, January 17, 1918.

MR. HOWARD B. FRENCH, *President of the Philadelphia College of Pharmacy,*
Philadelphia, Pa.

Dear Sir: It becomes my duty as Rector (President) of the University of Havana to send to you a copy of the resolutions unanimously adopted by the professors of the University in the regular meeting held on Jan. 14 inst. We all understand that the loss of Professor Remington is an irreparable one for your College as well as for the pharmaceutical profession.

Allow me to express in this occasion my personal sorrow for such a misfortune.

Believe me, dear Mr. President,

Very respectfully yours,

DR. GABRIEL CASUSO.

HAVANA, January 17, 1918.

RESOLUTIONS IN MEMORY OF PROFESSOR JOSEPH P. REMINGTON ADOPTED BY THE MEMBERS OF THE UNIVERSITY OF HAVANA, CUBA.

At the regular meeting of this University held on January 14 inst., after the reading and approval of the minutes of the previous session, Professor José Guillermo Díaz announced the loss of the exceptionally useful life of Prof. Joseph P. Remington. The assembly, composed of fifty members of all the Faculties of the University, as a tribute of respect and estimation toward our departed friend,

Resolved, That the President and Professors of the University of Havana deplore with profound sorrow the death of Professor Joseph P. Remington.

Resolved, That a message of condolence be sent by the Presi-

dent of the University to the family of late Prof. Remington, and to the College of Pharmacy of Philadelphia.

DR. CASUSO,
Rector (President).
DR. J. GOMEZ DE LA MARA,
Secretary.

UNIVERSITY OF GLASGOW,
9 February, 1918.

THE DEAN OF THE PHILADELPHIA COLLEGE OF PHARMACY:

Dear Sir: As chairman of the British Pharmacopœia Committee of the General Medical Council, I desire to express, for my colleagues and for myself, our deep regret for the death of Professor Joseph Price Remington, and our sympathy with the profession of pharmacy in the United States in their mourning for a great leader. Dr. Remington's relations with our Committee were ever cordial and helpful, and we remember with gratitude the valuable aid he afforded us in the preparation of the current issue of the British Pharmacopœia, 1914.

I should be obliged if you would convey our sympathetic sentiments to his bereaved family, as I am ignorant of the proper manner of addressing them. I am

Very sincerely yours,
DONALD MACALISTER,
President of the General Medical Council of the United Kingdom.

LIVERPOOL CHEMISTS' ASSOCIATION.
ROYAL INSTITUTION,
COLQUITT STREET,
LIVERPOOL,
February 27, 1918.

THE SECRETARY, PHILADELPHIA COLLEGE OF PHARMACY,
PHILADELPHIA, U. S. A.:

Dear Sir: The members of the Liverpool Chemists' Association at its meeting on February 13, 1918, unanimously agreed to a vote of condolence with your institution on the death of Professor Remington. His work on Practical Pharmacy and contributions to pharmaceutical research generally has made his name world-famous, and on those occasions when he visited England and became acquainted with several of our members, his personal charm appealed strongly to his fellow workers here.

I am directed to convey to your College the greetings of our association especially at this time when civilization is united in furthering the cause of liberty, freedom and brotherhood.

Trusting that worthy successors will be forthcoming to carry on the work of our deceased friend and comrade,

Yours faithfully,

DAVID H. EVANS,
Hon. Secretary.

DENVER, COLORADO, February 19, 1918.

WHEREAS, Death having removed one of America's foremost representatives of the pharmaceutical world, in the person of Joseph P. Remington, ex-President of the American Pharmaceutical Association, ex-Chairman of the Council of that body, Chairman of the Committee of Revision of the United States Pharmacopœia, Editor of the United States Dispensatory, Author of The Practice of Pharmacy, Dean of the Philadelphia College of Pharmacy:

Be it resolved, That the Denver Branch of the American Pharmaceutical Association hereby gives expression to the deep regret that it feels for his loss.

Resolved, That the Denver Branch extends to the bereaved family of the deceased, and to the President and Board of Trustees of the Philadelphia College of Pharmacy, the deepest sympathy in their bereavement.

Be it further resolved, That the Secretary be directed to transmit to Mrs. Elizabeth B. Remington and family, 1832 Pine St., Philadelphia, Pa., also to Mr. George M. Beringer, Chairman of the Board of Trustees, 501 Federal St., Camden, N. J., a copy of these resolutions.

SAMUEL T. HENSEL,
Committee.

[Seal.]

A. W. CLARK, *President of the Denver Branch of the American Pharmaceutical Association.*

FRED C. SHAW, *Secretary.*

CORRESPONDENCE.

DEPARTMENT OF AGRICULTURE,
BUREAU OF CHEMISTRY,
WASHINGTON, D. C.,
April 10, 1918.

MR. GEORGE M. BERINGER, EDITOR, AM. JOUR. OF PHARMACY,
145 N. 10TH ST., PHILADELPHIA, PA.

Dear Mr. Beringer:

Permit me to call attention to an error in the March number of your journal.

In the article entitled "Quarterly Review on the Advances in Pharmacy," Mr. Thum stated as follows: "To an American Pharmacist mention of the words 'Hanbury Medal' always brings to mind the first and only American pharmacist to have received this award, our dear and distinguished friend, the late Prof. John M. Maisch," etc.

You are of course aware of the fact that Dr. Frederick B. Power, now pharmaceutical research chemist, in charge of the phytochemical laboratory of the Bureau of Chemistry, has also been the honored recipient of the Hanbury Medal, as Mr. Thum could have learned by consulting the files of the JOURNAL. References to this fact are to be found on pages 290 and 566 of Vol. 85, 1913, and on pages 94 and 95 of Vol. 86, 1914, the congratulatory letter of Howard B. French, president of the Philadelphia College of Pharmacy, and the response of Dr. Power are reproduced. Since Dr. Power is one of the most distinguished sons of the college, and in fact a former pupil of Professor Maisch, as well as one of the most brilliant phytochemists in the world, it is highly proper that the error above referred to should be rectified in the JOURNAL as promptly as possible. Will you kindly give this matter your personal attention?

Respectfully,

V. K. CHESNUT.

THE NATIONAL PHARMACEUTICAL SERVICE ASSOCIATION.

At the regular monthly meeting of the National Pharmaceutical Service Association held April 9, 121 applications for membership were acted upon, bringing the total membership in the association well above the 1,200 mark.

Although less than one year old, this association has made great progress, and one of the very encouraging reports at the April meeting was that of the President, who stated that Congressman Edmonds had notified him that the propaganda work which had been done was bearing fruit, in that the number of Congressmen who were interested in seeing the Edmonds Bill passed was constantly increasing. Instead of being urged to vote for the measure, many of them are coming to Congressman Edmonds and offering their aid in having the bill pass the House.

Dr. E. G. Eberle reported for the delegation which had been sent by the Association to attend the Conference on the Edmonds Bill at Baltimore, March 18, and the hearing at Washington, March 19. A proposition from Mr. C. A. Mayo, of New York, to have petitions signed by members of the families of soldiers, asking that the Edmonds Bill be passed, was laid before the association, and it was decided to bring this matter before every member at an early date, so as to get the greatest value from this propaganda while the Committee on Military Affairs has the Edmonds Bill under consideration.

Mr. Ambrose Hunsberger reported that the support of the Philadelphia County Medical Society has been enlisted in this measure, and that they have appointed a committee of five physicians to coöperate in having the bill passed. The matter of sending literature on the newer antiseptic products to pharmacists now in the service was then discussed, and the committee which had been appointed for that purpose was instructed to consider it further.

Plans are being made by the executive committee to make the annual meeting of the association, which will be held some time during the second week of June, as comprehensive as possible.

The next meeting of the association will be held on Tuesday, May 14, 1918.

BOOK REVIEWS.

THE DISPENSATORY OF THE UNITED STATES OF AMERICA—TWENTIETH EDITION, by Joseph P. Remington, Ph.M., F.C.S., and Horatio C. Wood, Jr., M.D., and as Editorial Associates Samuel P. Sadtler, Ph.D., LL.D., Charles H. LaWall, Ph.M., Henry Kraemer, Ph.G., Ph.D., John F. Anderson, M.D. Publishers, J. B. Lippincott Company, Philadelphia and London.

The twentieth edition of this encyclopædia of materia medica covers another period of marked progress in the medical and pharmaceutical professions. Since the appearance of the previous edition in 1907, revisions of the United States Pharmacopœia and National Formulary have been published and likewise of a number of the foreign pharmacopœias; included among these may be mentioned those of Great Britain, France, Germany, Italy, Spain, Norway, Sweden and Finland. The full influence of the Food and Drugs Act of 1906 and of the Harrison Anti-Narcotic Act of 1914 upon medical practice has likewise become apparent. The great advances that have taken place in the sciences and in medical and surgical practices as well as, in the recent years, the effect of the world war upon these practices have all been agencies that have contributed toward making necessary the thoroughly revised and largely rewritten twentieth edition of this, the recognized commentary upon the standard authorities. This work of more than two thousand pages has crowded into it so much of the knowledge pertaining to materia medica, both fundamental for the practitioners and for reference, that it can not fail to retain its position as the compendium and guide alike to medicine and pharmacy.

The scope of the work, encyclopædic, and the style of treatment of the subjects has been continued as in the previous edition. The characteristic featuring of synonym, alternative quantities, diacritical marks as a guide to pronunciation, etc., have all been retained and several new ideas have been added among which we note the recognition of the "New and Non-Official Remedies" published by the American Medical Association and all such medicaments are designated by "N. N. R. 1917."

The uniform and systematic method of treating each subject adopted throughout Part I is especially commendable, as it permits one to locate quickly the information sought. The distinctive para-

graphs with appropriate headings show at once where to look for the botany or chemistry, the composition, action, uses, doses, etc.

As an untitled part of the book, there appears as a sort of prefatory a number of chapters containing important information, much of which is however of the character, that in other works is placed in an "appendix." Among these may be mentioned the "Abbreviations;" "Titles of Journals and Books Referred to in the Text;" "Glossary of Medical Terms;" "Index of Diseases," of especial interest to the practicing physician; "The Food and Drugs Act" with the several Amendments and the Regulations and numerous Food Inspection Decisions, which should be of great value to the mercantile interests; the "Harrison Narcotic Act" and the Regulations framed for its enforcement; and a well-compiled "Index" of these two federal acts and the regulations thereon.

Part I has been mainly restricted to the consideration of drugs and formulas official in the United States and British Pharmacopœias and the drugs of the National Formulary have been generally relegated to Part II and the consideration of all the N. F. formulas limited to a condensed abstract in Section 2 of Part III unaccompanied by comments either pharmaceutical or medical.

This method of the division of subjects has introduced many incongruities and minimized the consideration of many drugs and preparations that from their extended use must be considered as important in American medical practice and given undue prominence to some that are of scant use and relatively unimportant. This is the one feature of the book which we feel called upon to criticize adversely.

No well-defined rule has been adhered to in deciding what was to be admitted to the U. S. Pharmacopœia and what was to be incorporated into the National Formulary. In the absence of an established principle on this question and as the Food and Drugs Act, that has been given such prominence in this Dispensatory, designates both as "official" and of equal authority, we regret to note the attitude of the authors regarding the N. F. standards and the minimized treatment accorded to these. Many of the N. F. standards from either a commercial or medical viewpoint are of far more importance than are some of the foreign pharmacopœial subjects discussed in Part II. As examples, convallaria flowers and root, cocillana, condurango, euphorbia pilulifera, cypripedium, geranium, echinacea, etc., treated as N. F. drugs in Part II, are certainly more used and of

more importance in American practice than are Acaciæ Cortex, Belæ Fructus, Buteæ Semina, Ispaghula, Sappan, etc., included in Part I, because they are in the British Pharmacopœia. It is noted that these are given under their Latin official titles while the N. F. drugs as a rule are listed under their English or common names. Very few of the drugs listed in Part I are of greater commercial value than are the legal standards for Crocus, Cacao, and Vanilla, which as N. F. Drugs are listed in Part II.

The rule laid down, however, could not be invariably carried out in the case of drugs that were not recognized by the U. S. P. but were in both the British Pharmacopœia and the National Formulary. We find consequently, that such drugs as Chirata, Cusso, Euonymus and Krameria are presented under their British Pharmacopœial titles and the legal title, that of the N. F., may be only referred to in the article and in most of these cases the description and standards of the N. F. are given only secondary consideration, even if they are the law of the country.

We note also that in the class of Wines in Part I, the plan has had a "slip up" and that here after the titles for certain of the Br. Ph. wines such as those of antimony, colchicum, iron citrate, and ipecacuanha, (N. F.) has been added and not always bracketed.

All of the important parts of the United States Pharmacopœia IX have been included, almost verbatim, in this work and the N. F. only in abstract, at least so far as the formulas. Thus this book will in many ways replace the necessity for the two legal standards. The typography and "bookmaking" parts are excellent, clear, distinctly legible.

The recognized standing of the authors and editors makes the book especially valuable as a work of reference that can as a rule be relied upon. It will continue to be indispensable to every active physician, pharmacist and laboratory worker.

G. M. B.

TREATISE ON APPLIED ANALYTICAL CHEMISTRY. Methods and Standards for the Chemical Analysis of the principal Industrial and Food Products, by Professor Vittorio Villavecchia, Director of the Chemical Laboratories of the Italian Customs, with the collaboration of a number of trained investigators. Translated by Thomas H. Pope, B.Sc., A.C.G.I., F.I.C., University of Birmingham, England. Published by P. Blakiston's Son and Company, Philadelphia.

This treatise deals with the chemical analysis of industrial products, which is of great importance in the purchase of raw materials, in the control of manufacturing processes and in the determination of the value, impurities and adulterations of the finished products.

In many cases numerous methods are given in the literature, some of which are equal in accuracy to exact scientific investigations, while others require less precision and yield results relative only to the procedure employed; certain states have issued official standards and in many cases industrial concerns fix beforehand the methods to be employed for the analysis of the products.

It is the purpose of this book to give methods and standards for commercial analysis which have been either officially prescribed or repeatedly tested in the laboratories under the author's direction.

Vol. I deals with the analysis of potable waters, chemical products, fertilizers, cement materials, metals and alloys, fuels, tar and its derivatives, mineral oils and fatty substances and their industrial products. The first chapter deals with the analysis of water for potability and partial and complete analyses for industrial purposes.

The second chapter treats upon over a hundred different chemical products arranged alphabetically without regard to their organic or inorganic origin, from acetone and aniline to sulphur in its various forms and including the important acids and their salts and such compounds as chloroform, ether, bleaching powder, alum, etc.

Then follow chapters (III to X) on certain classes of substances: Fertilizers giving general methods and a special part for the examination of particular kinds. Cement; limes and cements, giving chemical and technical tests. Metals and alloys; of which a large number are treated, such as iron, special steel, aluminum, brass, bronze alloys, etc., metallic platings. Fuels; chemical analysis and calorific value. Coal tar and its products. Mineral oils and their derivatives; chemical and physical tests. Fatty substances; general methods of analysis, with special parts given to vegetable and animal oils and fats, marine animal oils and waxes. Industrial products from treatment of fatty matter; as specially treated oils (boiled, hydrogenized, etc.), soaps, glycerin, etc.

The book is well and concisely written and excellently translated and unnecessary repetition is avoided. In the examination of materials a brief description is given, the adulterants and impurities likely to be present stated and qualitative (and when important, quantitative) tests given for their detection or determination and, in

most cases, methods for the evaluation of the substance itself. Over fifty tables are included, giving the characters, composition, etc., of nearly every class of products treated.

This book will recommend itself highly to those analysts especially who have a large variety of substances to examine and to those who desire a guide to tried and tested methods.

Vol. II, which is soon to be issued, will treat of food products, alcoholic beverages, essential oils, varnishes, rubber, tanning materials, colors, textiles, etc.

JOSEPH W. EHMAN.

NEWS ITEMS AND PERSONAL NOTES.

Powers-Weightman-Rosengarten Co. Round Out a Century of Commercial Activity.—This well-known firm of chemical manufacturers have made a modest announcement, in the usual Philadelphia conservative style, that "the firm has completed one hundred years of continuous activity in the chemical industry in America."

This consolidation of two of Philadelphia's noted chemical manufacturing firms traces back its commercial history to those early pioneers in the manufacture of medicinal chemicals George D. Rosengarten, Charles Zeitler and John Farr. During the century, the further efforts of Thos. H. Powers, William Weightman and the Rosengartens have marked a continuous development of one of the city's greatest industries. The awards of medals made to both Powers & Weightman and Rosengarten & Sons at numerous exhibitions and by scientific bodies have been well-earned testimonies to the quality of their productions and the integrity of their business management.

The AMERICAN JOURNAL OF PHARMACY is pleased to extend to Messrs. Powers-Weightman-Rosengarten Co. on this occasion our sincere felicitations and congratulations accompanied by hearty best wishes for continued prosperity and the success that their efforts merit.

Prof. Charles H. LaWall Elected Chairman of the Committee of Revision of the U. S. P.—The Committee of Revision of the United States Pharmacopœia have elected Prof. Charles H. LaWall as the chairman to succeed Professor Joseph P. Remington. This is an-

other responsibility that has lately come to our Dean, but as he is full of vigor and possesses the ability required we predict that he will in this, as in other matters, make his great responsibilities great successes.

A National Duty.—In the present war crisis, the pharmacists of the country must assume their full share of the responsibility. Even though we have been selected for special taxation, this burden will not relieve us from other duties of citizenship. The immediate necessity is to aid in the Third Liberty Bond Issue.

The Pennsylvania Board of Pharmacy.—Examinations for registration as pharmacist or as qualified assistant pharmacist will be conducted in the Philadelphia College of Pharmacy and in the Pittsburgh College of Pharmacy on Friday and Saturday, June 7 and 8, 1918. For further information address L. L. Walton, Secretary, Williamsport, Pa.

The Lily Scientific Bulletin.—Acknowledgment is made of the receipt of Number 9, Series 1, of *The Lily Scientific Bulletin.* This number of this house bulletin contains papers by the scientific staff of the laboratory on the pharmacologic studies of the ipecac alkaloids.

Cash Prizes for the Best Article on the Value of the Wholesale Druggist.—The National Wholesale Druggists' Association announces a prize contest open to salesmen of wholesale drug houses for the best papers on "The Economic Value of the Wholesale Druggist and Reasons Why He is Essential." Ten cash prizes in amounts from $20 to $150 and aggregating $500 will be awarded by the committee of which G. B. Moxley, of Indianapolis, is chairman.